

NEW AMPHIPODA FROM THE SOUTHERN OCEAN, WITH PARTIAL REVISIONS OF THE ACANTHONOTOZOMATIDAE AND PARAMPHITHOIDAE

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Abstract.—Six new species and 1 new genus of Acanthonotozomatidae, 2 new species of Paramphithoidae and 1 new species of Stegocephalidae are described from Antarctic waters, chiefly of the Scotia Sea region. New revisions are offered for the acanthonotozomatid genera *Acanthonotozomella*, *Iphimedia*, *Iphimediella*, and *Pseudiphimediella* and the paramphithoid genera *Epimeria* and *Parepimeria*.

With this paper we begin a series of studies on the Amphipoda from the Scotia Sea region of the Southern Ocean. This and the following papers will be directed toward the redescription of poorly known or incorrectly described species as well as the description of new species. To facilitate the redescription of older taxa and the revision of generic concepts we have borrowed much type-material and would like to thank the following persons and institutions for making specimens available to us: Dr. Denise Bellan-Santini, Station Marine d'Endoume; Ms. Joan Ellis, British Museum (Natural History); Ms. Elizabeth Louw, South African Museum; Dr. H.-E. Gruner, Zoologisches Museum der Humboldt—Universität zu Berlin; and Dr. Roy Olerod, Swedish Museum of Natural History. Additional material was sent to us for examination by Dr. R. Y. George and Dr. L. D. McKinney. We would like to express our gratitude to Ms. Patrice Rossi whose pencil and ink illustrating capabilities saved us much time and effort, and to Dr. J. L. Barnard for his critical examination of our manuscript.

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Acanthonotozomatidae

Acanthonotozomella Schellenberg

Acanthonotozomella Schellenberg, 1926:332.

Paracanthonotozoma Bellan-Santini:1972:177 (new synonymy).

Type-species.—*Acanthonotozomella alata* Schellenberg, 1926 (original designation).

Diagnosis [modified from Schellenberg (1926) and J. L. Barnard (1969)].—Body with numerous processes; telson wide, entire to emarginate; antenna 1 shorter than antenna 2, accessory flagellum absent; upper lip distally grooved; mandible incisor multi-toothed, molar poorly developed, with setal row extending between incisor and molar; inner plate of maxilla 1 not minute, few setae distally, palp biarticulate, reaching end of outer plate; maxilliped well-developed, palp 4-articulate, article 2 not expanded or produced; gnathopods 1 and 2 simple, alike; coxae 1 and 3 subrectangular, coxa 2 shorter than either coxa 1 or 3; coxae 5–7 rounded.

Remarks.—The genus *Acanthonotozomella*, as diagnosed above, is considered here to contain the following species: *A. alata*, Schellenberg 1926; *A. trispinosa* (Bellan-Santini 1972), originally described as the type-species of the genus *Paracanthonotozoma*; and *A. barnardi* n. sp., described below. Recently, Bushueva (1978) described the species *A. pushkini*, but as will be discussed below, we believe this species represents a distinct genus, intermediate in position to *Acanthonotozomella* and *Acanthonotozomoides*, to which we will give the name *Acanthonotozomoposis*. The genera, *Acanthonotozoma*, *Acanthonotozomoides*, *Acanthonotozomella* and *Acanthonotozomoposis* are united by their common possession of the following features: gnathopods 1 and 2 simple; maxilla 1 palp 2-articulate; maxilliped palp exceeds outer plate, 4-articulate, article 2 not produced or expanded. The characters which distinguish these genera are given in Table 1. *Acanthonotozomoides* and *Acanthonotozomella* can be readily characterized by features of the body as well as mouthparts. Bushueva (1978) used the shape of coxae 1–3, maxilliped palp article 2 not produced along article 3 and pereopod 7 larger than 5 and 6 to assign her species *pushkini* to *Acanthonotozomella*. However, the presence of a minute inner plate and expanded palp article 2 on maxilla 1, lack of acute body processes, form of mandible incisor and similarity of coxae 1 and 2 distinguish Bushueva's species from all others in Table 1 and warrants, in our opinion, the erection of a new genus.

Acanthonotozomella trispinosa (Bellan-Santini), new combination

Paracanthonotozoma trispinosum Bellan-Santini, 1972:177, pl. 6.

Diagnosis.—Coxae 1 and 3 anteroventral corners produced; antenna 1 peduncle article 1 with distal tooth; mandible seta row short; pereopods 5, 6 and 7 alike, all with excavate posterior margins, lobe above excavation subacute.

Remarks.—Comparison of the type-specimen of *A. alata* with the illustrations of *A. trispinosa* revealed many similarities, especially in dorsal armature. They were found to differ in the following features: coxa 2 is distally rounded in *A. alata* and is distally subacute in *A. trispinosa*; antenna

Table 1.—Comparison of the four genera of Acanthonotozomatidae which constitute the *Acanthonotozoma*-complex.

	<i>Acanthonotozoma</i> Boeck 1876	<i>Acanthonotozomoides</i> Schellenberg 1931	<i>Acanthonotozomella</i> Schellenberg 1926	<i>Acanthonotozomopsis</i> n. gen.
Component species	9 species	<i>A. oatesi</i> (K. H. Barnard 1930) <i>A. subtilioralis</i> Schellenberg 1931	<i>A. alata</i> Schellenberg 1926 <i>A. barnardi</i> n. sp. (Bellan-Santini 1972)	<i>A. pushkini</i> Bushueva 1978
Body processes	Acute	Acute	Acute	Bluntly rounded
Coxae 1–3	Progressive increase in size posteriorly	Progressive increase in size posteriorly	Coxa 2 different shape than 1 and 3, shorter than or equal to 3	Coxa 2 shorter than 3
Coxa 4 posterior margin	With protuberance	With protuberance	With protuberance	Without protuberance
Mandible seta row	Absent	Present	Present	Present
Mandible incisor	Narrow	Narrow	Narrow	Broad
Maxilla 1 inner plate	Not minute	Minute	Not minute	Minute
Maxilla 1 palp	Narrow	Narrow	Narrow	Expanded
Maxilliped palp article 2	Not produced; linear	Produced; linear	Not produced; linear	Not produced; broadened
Gnathopods 1 and 2	Dissimilar	Similar	Similar	Similar
Telson	Cleft	Entire	Entire to emarginate	Entire

1 peduncle article 1 bears a dorsal tooth in *A. trispinosa* but such a tooth is absent in *A. alata*; the hind margin of pereopods 5–7 basis is rounded above the excavation in *A. alata* but forms an acute lobe in *A. trispinosum*. Since the specimens also differed strongly in size (*A. alata*, 3 mm; *A. trispinosa*, 12 mm) it is possible that the above differences are size-related and the two species are synonymous. Also see comparisons in Table 1.

Acanthonotozomella barnardi n. sp.

Figs. 1–3

Material.—Holotype: *Eltanin* Cruise 9, Sta. 740, 18 Sept. 1963, 56°06'S, 66°19–30'W, 384–494 m, 1 ♂ (USNM 173583).

Diagnosis.—Pleonite 3 with single, dorsal, upright tooth; coxa 1 rectangular distally, not produced acutely at anterodistal corner; coxa 2 rectangular distally; mandible with multidenticulate incisor and poorly developed molar with row of more than 30 setae between incisor and molar; bases of pereopods 5 and 6 similar, anterior and posterior margins almost parallel with posterodistal corner extending downward in a smooth lobe; pereopod 7 distinct from pereopods 5 and 6, posterior margin of basis excavate distally, posterodistal corner extended downward as a slender lobe.

Description.—Head, without rostrum, shorter than pereonite 1. Integument of body covered with small conelike papillae giving rough appearance. Pereonite 1 to urosomite 1 each with single dorsal projection extending upward and posteriorly. Projection on pereonite 1 forming upright, truncate keel with slight posterior extension. Projections on pereonites 2–6 in form of upright, posteriorly projecting teeth on posterior part of each somite, increasing in size with successive somite. Pleonite 3 bearing single upright keel, posterior part of which forms subacute apex without projecting over following somite. (Exact structure of tooth on urosomite 1 uncertain as it was broken on this specimen.) Pleurae of pereonites 1–7 all projecting outward and posteriorly. Epimeral plates 1–3 each with lateral tooth on posterior margin. Distal margin of epimeral plate 1 forming subacute point. Distal margin of epimeral plates 2 and 3 rounded anteriorly, more angular posteriorly. Coxae 1–3 rectangular distally. Coxa 1 slightly excavate anteriorly. Coxa 2 more slender distally and shorter than coxa 1 or 3. Coxa 4 lower margin crescentic. Coxae 5–7 rounded posteriorly.

Rostrum with raised lateral edges, shorter than first peduncle article of antenna 1. Ocular bulge pronounced. Antenna 1 peduncle article 1 equal in length to combined lengths of articles 2 and 3, accessory flagellum absent. Article 4 of antenna 2 subequal to article 5. Upper lip distinctly grooved with fine hairs along edge to either side of groove. Mandible multidenticulate; toothed accessory plate present on right mandible; molar poorly developed with row of approximately 34 setae between incisor and molar; palp

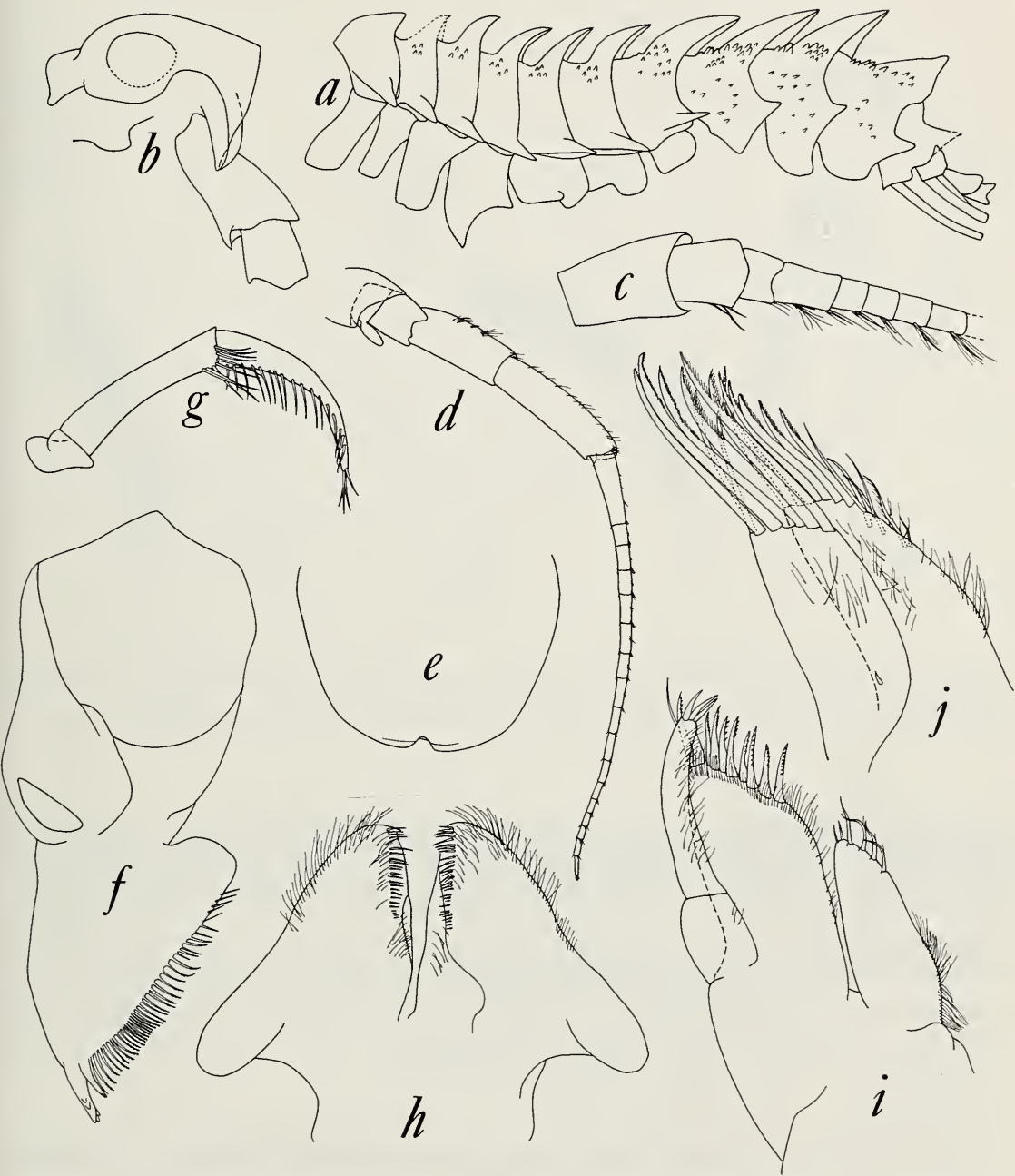


Fig. 1. *Acanthonotozomella barnardi*, male: a, Body, side view; b, Head; c, Antenna 1; d, Antenna 2; e, Upper lip; f, Mandible; g, Mandible palp; h, Lower lip; i, Maxilla 1; j, Maxilla 2.

articles 2 and 3 equal in length. Lower lip tapering distally and unnotched. Palp of maxilla 1 biarticulate and extending past outer plate; inner plate slender with 2 short spines and 4 longer setae on distal margin. Maxilla 2 inner and outer plates subequal in length, serrate setae on distal margins of both, somewhat longer on outer plate. Maxilliped palp 4-articulate, articles 1–3 equal in length, article 4 slightly shorter and bearing approximately 5



Fig. 2. *Acanthonotozomella barnardi*, male: a, Maxilliped; b, Gnathopod 1; c, Gnathopod 2; d, Telson.

setae on tip. Gnathopods simple and alike; carpus slightly longer than propodus, dactyl half length of propodus. Pereopods 5 and 6, anterior and posterior margins of basis parallel with posterodistal corner, extending downward as rounded lobe past distal margin of ischium. Pereopod 7 basis excavate behind with posterodistal corner extending downward as a subacute lobe past distal margin of ischium. Telson appears to be entire, poor condition of distal margin makes this uncertain. No uropods were intact.

Etymology.—This species is named in honor of Dr. J. L. Barnard.

Distribution.—Known only from the type-locality.

Remarks.—This species differs from *A. alata* and *A. trispinosa* primarily by having a single dorsal tooth on pleonite 3 (vs. 2 teeth), a distally truncate coxa 2 (vs. round or subacute), pereopods 5 and 6 hind margin not excavate (vs. excavate), and a long seta row (ca. 30 setae) on the mandible (vs. 8–10 setae).

Acanthonotozomopsis n. gen.

Type-species.—*Acanthonotozomella pushkini* Bushueva 1978.

Diagnosis.—Body with blunt dorsal and lateral processes; coxa 2 shorter than but similar in shape to coxae 1 and 3; coxa 4 triangular, without posterior protuberance; mandible incisor broadened, seta row long; maxilla 1

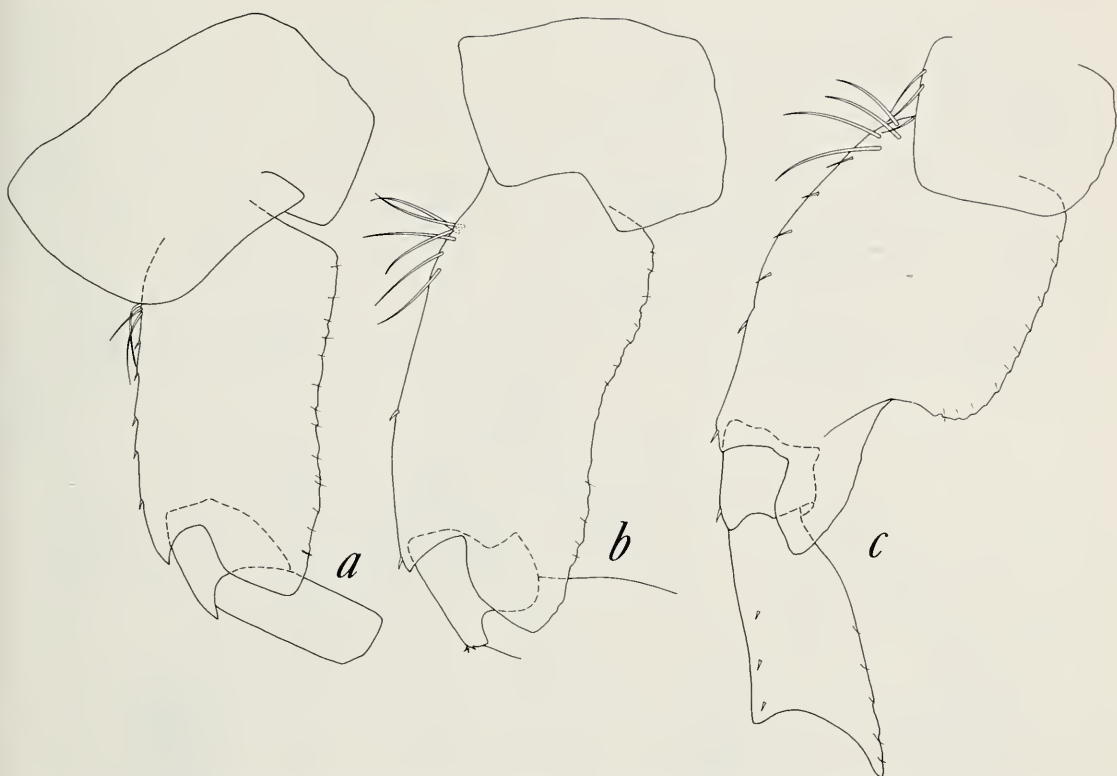


Fig. 3. *Acanthonotozomella barnardi*, male: a, Pereopod 5; b, Pereopod 6; c, Pereopod 7.

inner plate minute, palp article 2 expanded; maxilliped palp article 2 broad, not produced along article 3; gnathopods simple, of similar shape; telson entire.

Remarks.—The distinctiveness of this genus is discussed in the remarks for *Acanthonotozomella* and its features listed in Table 1.

Iphimedia Rathke

Iphimedia Rathke, 1843:85.

Panoploea Thomson, 1880:2.—Karaman and Barnard, 1979:110.

Cypsiphimedia K. H. Barnard, 1955:87 (new synonymy).

Type-species.—*I. obesa* Rathke 1843.

Diagnosis.—Upper lip entire or slightly emarginate; maxilla 1 palp biarticulate, of variable length; maxilliped palp exceeding outer plate, 3-articulate, article 2 produced medially along article 3; gnathopod 1 chelate; gnathopod 2 chelate or subchelate; telson variably emarginate or incised.

Remarks.—At their extremes, *Iphimedia* and *Panoploea* were significantly different from each other. Karaman and Barnard (1979), when synonymizing the two genera, showed there was a continuous variation in shape and size of upper and lower lips, mandible and maxilla 1 palp. Krapp-

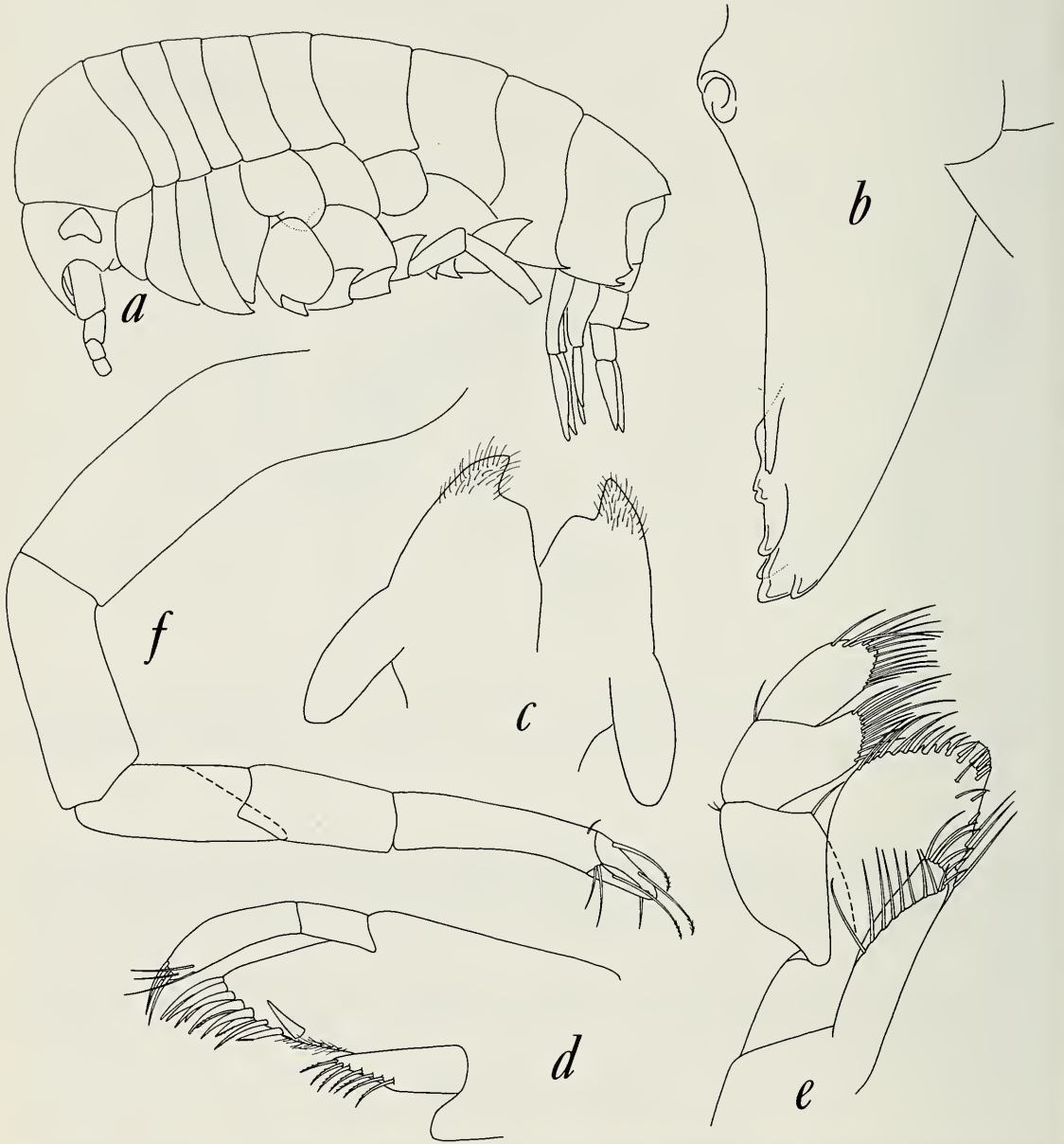


Fig. 4. *Iphimedia gibba*: a, Body, side view; b, Mandible; c, Lower lip; d, Maxilla 1; e, Maxilliped; f, Gnathopod 1.

Schickel (1976) noted that the palp of maxilla 1 of *I. minuta* changed in length with size of the individual. Karaman and Barnard (1979) further distinguished *Iphimedia* from the closely related *Cypsiphimedia* on the basis of the latter possessing an enlarged first pereonite and lacking dorsal body processes (but see later). As with the palp of maxilla 1 and the strength of the mandible, it can be shown that there is also a gradation in size of pereonite 1, ranging from equal to pereonite 2 in *I. obesa* Rathke, as long as pereonites 2 and 3 in *I. spinosa* (Thomson), to as long as pereonites 2–4 in

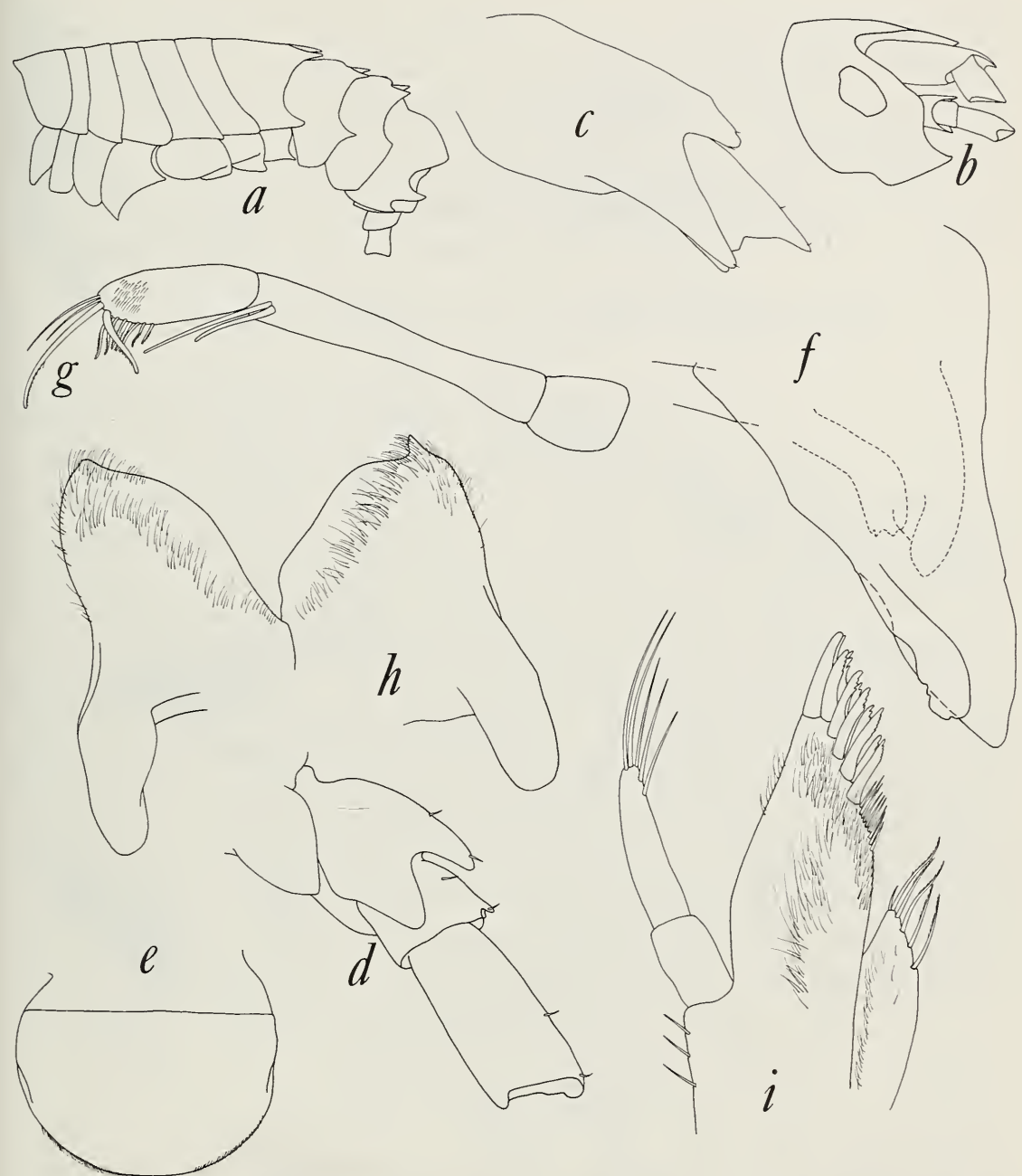


Fig. 5. *Iphimedia magellanica*, female: a, Body, side view; b, Head; c, Antenna 1 peduncle articles 1 and 2; d, Antenna 2 peduncle; e, Upper lip; f, Right mandible; g, Mandible palp; h, Lower lip; i, Maxilla 1.

I. eblanae (Bate). Additionally, the number and shape of dorsal processes range from 4 pairs of short teeth (*I. obesa*), to 3 pairs of long and slender teeth (*I. joubini*), to 3 pairs of short processes (*I. spinosa*), to a single minute pair of processes (*I. excisa*). Thus, the species assigned to *Cypsi-phimedia* by Karaman and Barnard (1979) are not outside the concept of *Iphimedia* as diagnosed above. This genus, more than any other in the

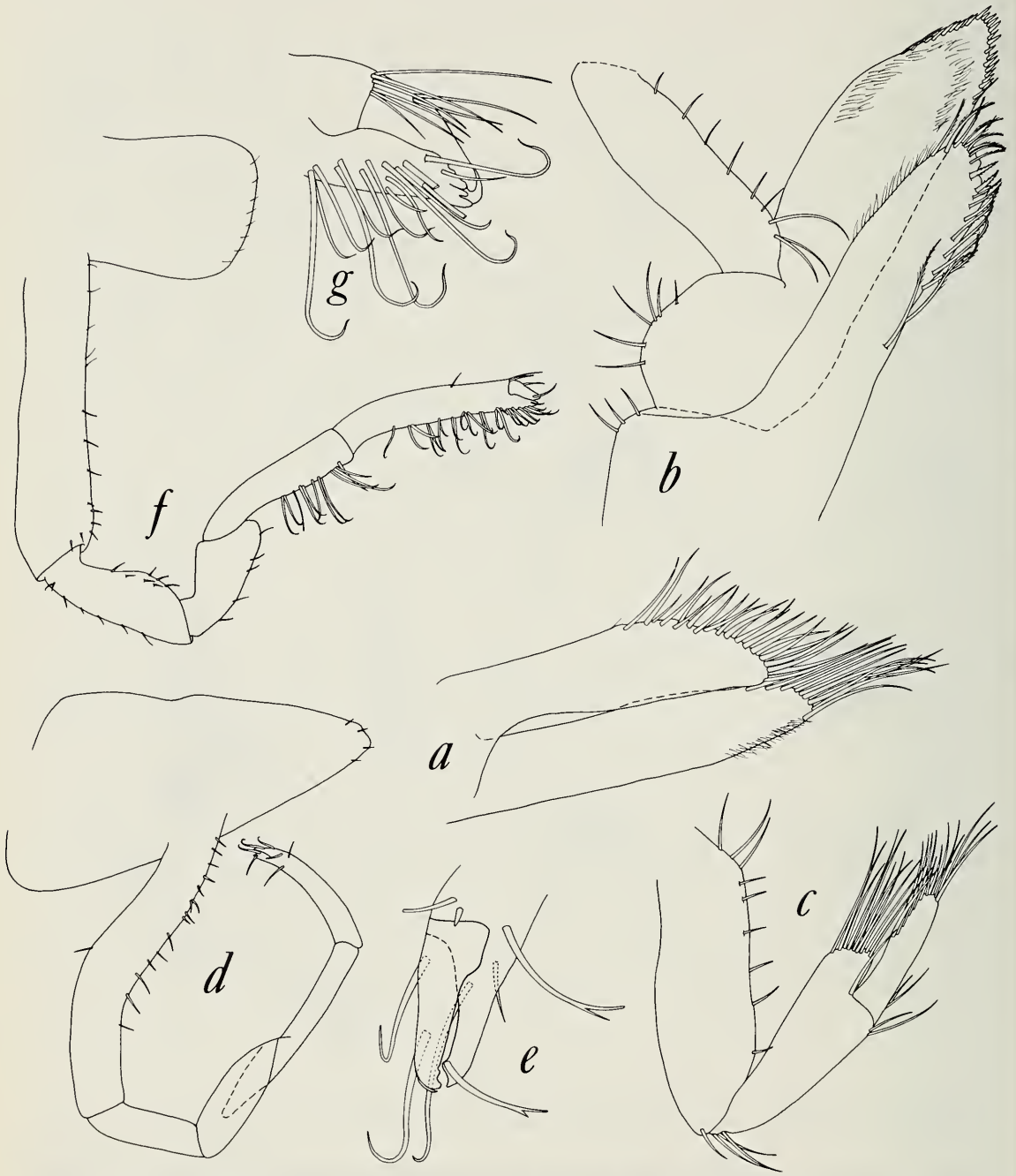


Fig. 6. *Iphimedia magellanica*, female: a, Maxilla 2; b, Maxilliped without palp; c, Maxilliped palp; d, Gnathopod 1; e, Gnathopod 1 propodus fixed finger and dactyl; f, Gnathopod 2; g, Gnathopod 2 propodus fixed finger and dactyl.

family, is characterized by a series of gradational characters. In our opinion the genus needs a further re-examination and perhaps should be subdivided into more discrete units. It is also one of the few acanthonotozomatid genera to be extensively represented outside polar waters. The genus as presently constituted contains the following species: *I. capicola* K. H. Barnard, *I.*

discreta Stebbing, *I. eblanae* (Bate), *I. excisa* (K. H. Barnard), *I. gibba* (K. H. Barnard), *I. gladiolus* K. H. Barnard, *I. grossimana* Ledoyer, *I. haurakiensis* Hurley, *I. imparilabia* n. sp., *I. joubini* (Chevreux), *I. jugoslavica* Karaman, *I. macrocystidis* (K. H. Barnard), *I. magellanica* n. sp., *I. minuta* (Sars), *I. multidentata* (Schellenberg), *I. obesa* Rathke, *I. orchestimana* Ruffo, *I. pacifica* Stebbing, *I. rickettsi* (Shoemaker), *I. spinosa* (Thomson), *I. stegosaura* (Griffiths).

Iphimedia gibba (K. H. Barnard), new combination

Fig. 4

Cypsiphimedia gibba K. H. Barnard, 1955:88, fig. 43.

Material.—Holotype: South African Museum No. 10318.

Diagnosis (emended from K. H. Barnard, 1955).—Body with minute paired dorsal processes on pleonite 3, otherwise smooth dorsally; pereonite 1 expanded, head directed ventrally; lower lips apically notched; maxilla 1 palp longer than outer plate; gnathopod 2 propodus ovate.

Description.—The following supplements the description given by K. H. Barnard (1955). Body with pair of minute dorsal processes on pleonite 3. Epimeral plate 3 posteroventral corner with 2 teeth. Mandible accessory plate minute, feebly bidentate. Maxilla 1 palp longer than outer plate. Maxilliped palp 3-articulate; article 2 expanded and produced along article 3.

Remarks.—Our re-examination of the holotype has shown the mouthparts of this species to be typical of *Iphimedia*. Also, contrary to the statement of Karaman and Barnard (1979) the palp of maxilla 1 is in fact longer than the outer plate. The size of pereonite 1 is not beyond the range otherwise seen for *Iphimedia* and its ties to the genus appear to be strengthened by the presence of minute dorsal processes on pleonite 3.

Iphimedia magellanica n. sp.

Figs. 5–7

Material.—Holotype. *Eltanin* Cruise 11, Sta. 977, 13 Feb. 1964, 52°32'S, 63°53'W, 299 m, 1 ♀ with eggs (USNM 173584), 6 mm. Paratypes: same station, 4 juveniles (USNM 173585).

Diagnosis.—Body with short, paired dorsal processes on pereonite 7 and pleonites 1 and 2; pleonites 1–3 with mid-dorsal keel; pereopod 7 basis posterior margin with 3 teeth, coxa with single posterodistal tooth.

Description.—Body with 3 pairs dorsal processes, all short and somewhat curved downward; pleonites 1 and 2 with short mid-dorsal keel; pleonite 3 mid-dorsal keel enlarged. Pleurae on pereopods 5–7 extend as posteriorly-directed acute processes. Epimeral plates 1 and 2 with small posterodistal tooth. Hind margin of epimeral plate 3 with 2 teeth. Head lateral margin

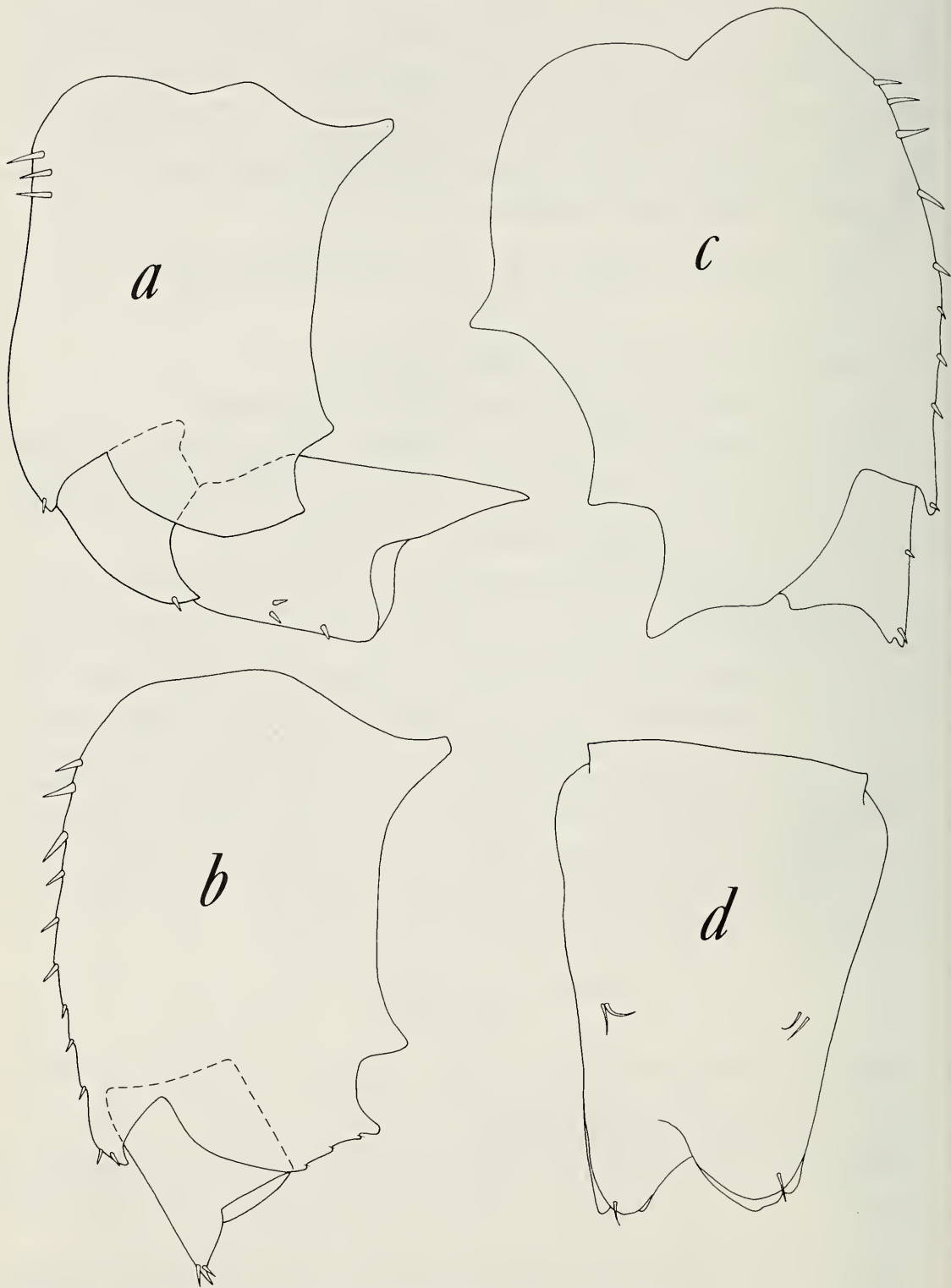


Fig. 7. *Iphimedia magellanica*, male: a, Pereopod 5; b, Pereopod 6; c, Pereopod 7; d, Telson.

slightly produced as acute process distally; rostrum extends nearly length of first peduncle article of antenna 1. Ventral tooth of antenna 1 peduncle article 1 extends to end of peduncle article 2, dorsal tooth small. Antenna 2 peduncle article 3 with short lateral and dorsal apical teeth. Upper lip broadly rounded, with paired ventrolateral groups of fine setae. Left mandible with blunt, smooth incisor, accessory plate weakly toothed; right mandible without accessory tooth; palp article 2 twice length of article 3, armed with only 2 distal setae; third palp article with setae on ventral margin of distal third of article. Lower lip variably incised. Maxilla 1 palp biarticulate, not reaching end of outer plate; inner plate small, with 5 long setae; outer plate with 11 stout setae apically. Maxilla 2 slender, inner and outer plates subequal in width; distal setae on outer plate only slightly longer than on inner plate. Maxilliped palp 3-articulate, article 2 produced medially along article 3, article 1 longer than article 2, third article elongate, distally blunt, two-thirds the length of article 2; inner plate narrow, armed with plumose setae along distal half of inner margin; outer plate apically subacute.

Gnathopod 1 chelate; coxa distally subacute, with 4 short setae; basis with scattered short setae along inner margin; dactyl equal in size to fixed finger of propodus, with 2 long, blunt setae; propodus fixed finger with 4 long setae, 2 of which are distally forked. Gnathopod 2 chelate; coxa distally quadrate; article 6 longer than article 5. Pereopods 5–7, basis posterior margin with 3 teeth, 1 located dorsally and 2 ventrally. Uropod 1 rami subequal; uropod 2 outer ramus shorter than inner. Telson shallowly cleft.

Etymology.—Name derived from Magellanic zoogeographic province.

Distribution.—Known only from locality listed above.

Remarks.—This species is distinctive among species of *Iphimedia* in its possession of only 3 pairs of short, downwardly curving dorsal processes and single, upright keel on pleonite 3 in combination with the form of the posterior pereopods and coxae. The general body form suggests affinities with *I. multidentata* and *I. macrocystidis*; however the absence of paired posterior teeth on coxa 7 and the number of teeth on pereopod 7 basis hind margin readily distinguish *I. magellanica* from both species.

Iphimedia imparilabia n. sp.

Figs. 8, 9

Material.—Holotype: *Eltanin* Cruise 6, Sta. 340, 3 Dec. 1962, 53°07–08'S, 59°21–23'W, 567–578 m, 1 ♂, 7 mm (USNM 173586).

Diagnosis.—Body with short, paired dorsal processes on pereonite 7 and pleonites 1 and 2, and with mid-dorsal keel on pleonite 3; pereopod 7 coxa posterior margin rounded, basis posterior margin slightly concave distally, without conspicuous teeth; maxilla 1 palp biarticulate, short; maxilliped palp article 3 very short.

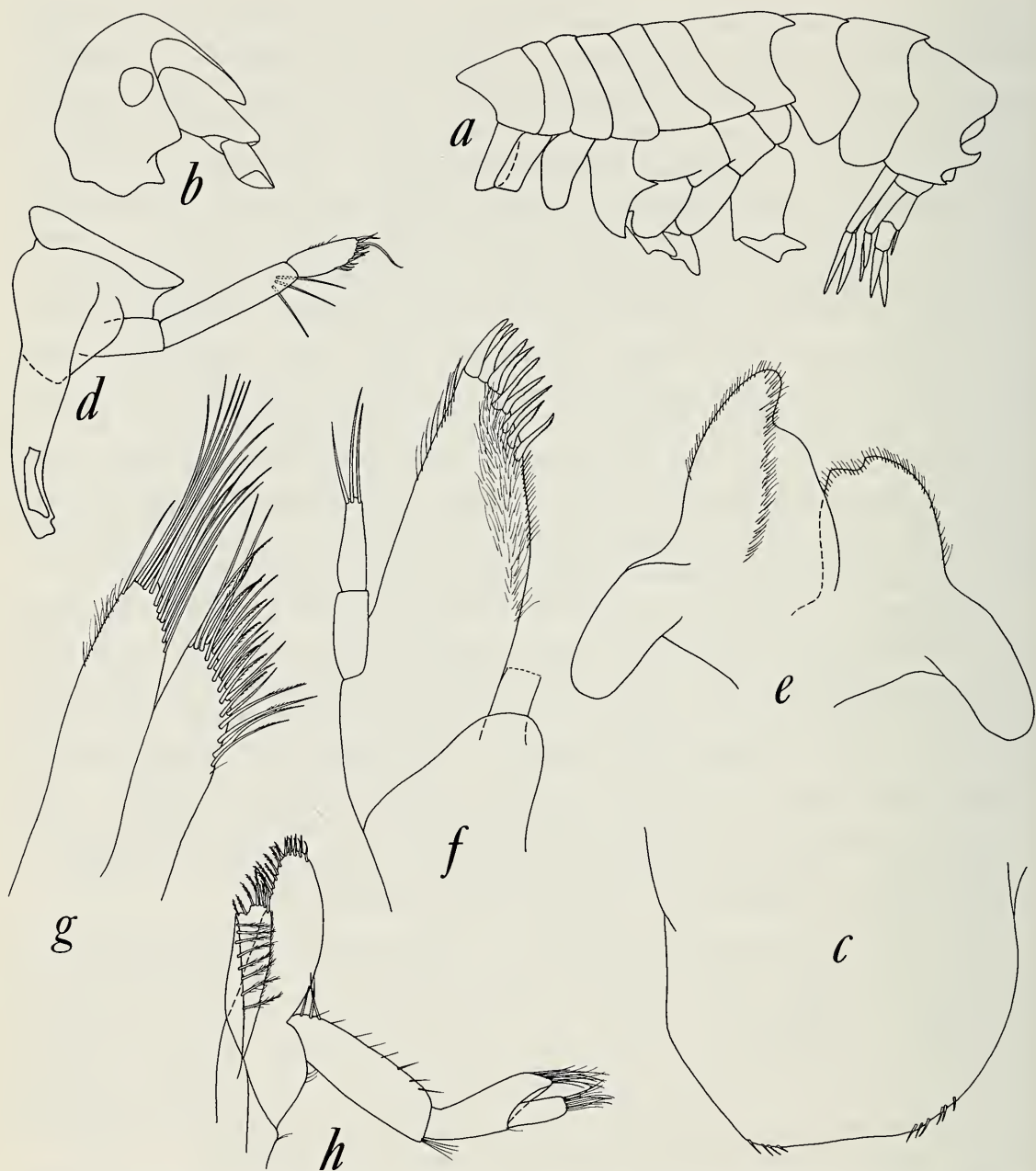


Fig. 8. *Iphimedia imparilabia*, male: **a**, Body, side view; **b**, Head; **c**, Upper lip; **d**, Mandible; **e**, Lower lip; **f**, Maxilla 1; **g**, Maxilla 2; **h**, Maxilliped.

Description.—Head interantennal angle subacute, anteroventral corner with short subacute process. Body with short, paired dorsal processes on pereonite 7 and pleonites 1 and 2; mid-dorsal keel strongly developed on pleonite 3. Pleurae on pereonites 5–7 not conspicuously produced. Epimeral plates 1 and 2 without teeth at posterodistal corners; epimeral plate 3 with lateral and distal teeth on posterior margin. Coxa 2 subrectangular; coxa 7 rounded posteriorly.

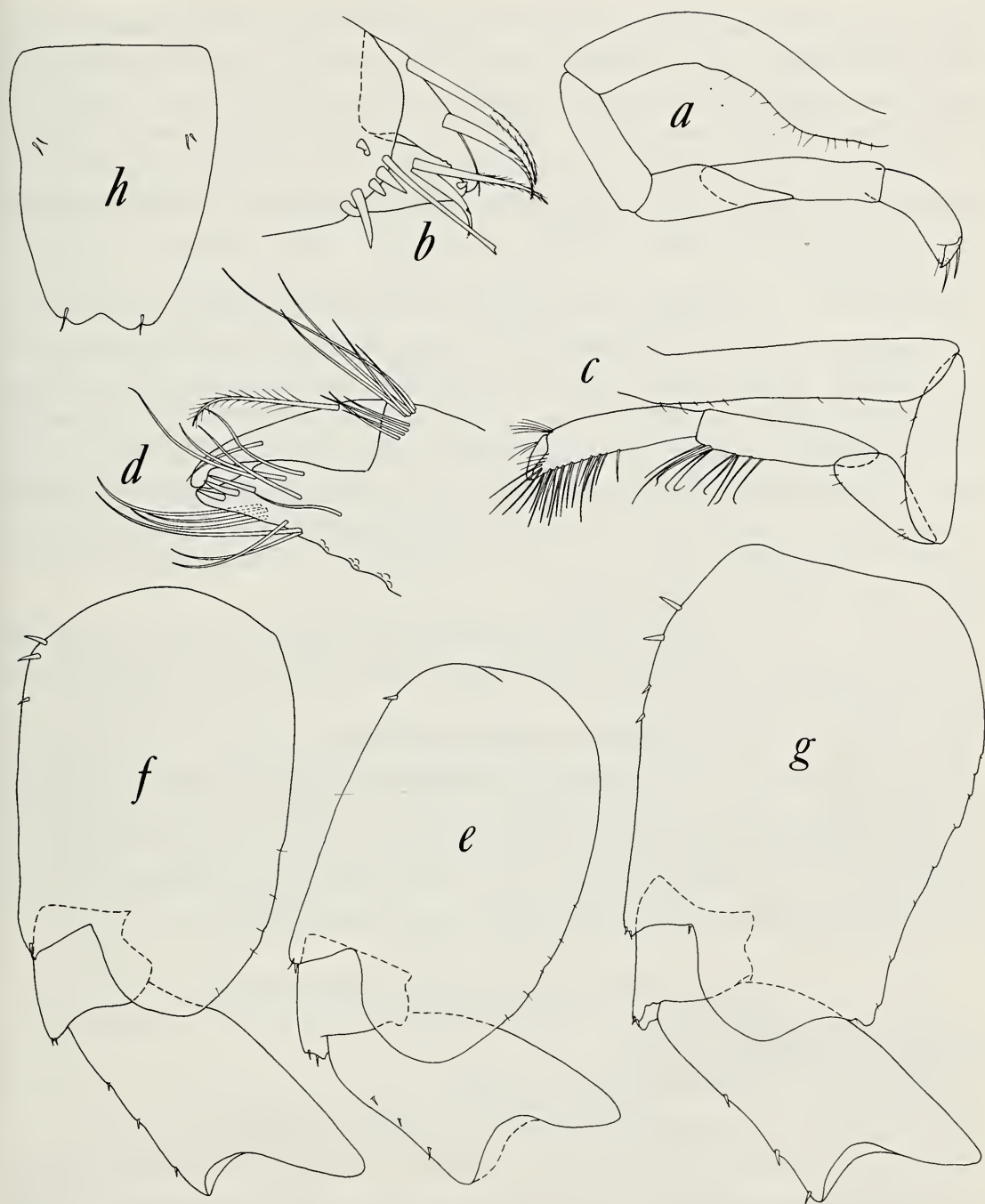


Fig. 9. *Iphimedia imparilabia*, male: a, Gnathopod 1; b, Gnathopod propodus fixed finger and dactyl; c, Gnathopod 2; d, Gnathopod 2 propodus fixed finger and dactyl; e, Pereopod 5; f, Pereopod 6; g, Pereopod 7; h, Telson.

Antenna 1 peduncle article 1 without major teeth on distal margin; peduncle article 2 with short, blunt dorsal tooth distally. Upper lip truncate distally, with paired groups of distolateral setae. Mandible incisor elongate, slightly spooned, accessory plate on left mandible elongate; palp article 2 with distal group of 3 setae; palp article 3 half length of article 2, with 9

distal setae. Lower lip lobes unequal in length distally, both incised. Maxilla 1 palp biarticulate, not reaching end of outer plate, articles subequal in length, outer plate 10 stout setae apically; inner plate broken. Maxilla 2 inner and outer plates subequal in width; outer plate bearing setae equal to three-fourths length of plate, much longer than those on inner plate. Maxilliped palp 3-articulate, article 2 produced medially along most of length of short article 3; outer plate without setae along outer margin; inner plate truncate distally.

Gnathopod 1 subchelate; article 6 shorter than 5; dactyl and propodus fixed finger shortened. Gnathopod 2 chelate; articles 5 and 6 subequal in length; article 6 with setae along distal half of ventral margin; fixed finger of propodus with dense cover of setae. Pereopod 5 and 6 basis posterodistal corner narrowly rounded. Pereopod 7 basis posterior margin distally concave, with few small serrations. Uropod 1 rami subequal, armed with short setae. Uropod 2 outer ramus shorter than inner, both with a few short setae. Uropod 3 rami sublanceolate, armed with short setae. Telson slightly emarginate, with terminal pair of setae.

Etymology.—The species name is derived from the Latin *impar*, meaning unequal and *labium* meaning lip, referring to the unequal lobes of the lower lip.

Distribution.—Known only from the type-locality.

Remarks.—The form of the dorsal body processes on this species closely resembles those of several other species such as *I. spinosa* and *I. capicola*; however, the following mouthpart features distinguish it from all other members of the genus: lower lip with unequal lobes; very short palp article 3 and lack of setae on outer plate outer margin on the maxilliped.

Iphimediella Chevreux, new synonymy

Iphimediella Chevreux 1911.

Pariphimediella Schellenberg 1931 (part).

Type-species.—*I. margueritei* Chevreux 1912.

Diagnosis [modified from Barnard (1969)].—Antenna 1 accessory flagellum uniarticulate; epistome not broad, less than 3 times as wide as high; upper lip entire or weakly incised; mandible incisor elongate, not excessively thickened or broadened, oriented to cut in transverse plane; lower lip without inner lobes, distal apices generally subacute; maxilla 1 palp biarticulate, reaching end of outer plate; maxilliped palp 4-articulate, article 2 scarcely or not produced; gnathopods 1 and 2 chelate; telson slightly cleft.

Remarks.—Karaman and Barnard (1979) noted that only minor differences in the mandible and lower lip had been used by Schellenberg (1931) to separate *Pariphimediella* and *Iphimediella*. We do not agree with Karaman and Barnard, however, in including *Pseudiphimediella nodosa* Dana

and *Pariphimediella glabra* Schellenberg in the genus *Iphimediella* as presently defined. These two species have mouthparts which are more broadened and have mandible incisors which cut in the frontal plane as opposed to the transverse-plane orientation seen in *Iphimediella*. According to the above diagnosis, the genus *Iphimediella* is here considered to consist of the following species: *I. bransfieldi* K. H. Barnard, *I. cyclogena* K. H. Barnard, *I. margueritei* Chevreux, *I. rigida* K. H. Barnard, *I. imparidentata* (Bellan-Santini), *I. microdentata* (Schellenberg), *I. octodentata* (Nicholls), *I. serrata* (Schellenberg). The latter two may be synonymous as Nicholls (1938) evidently mistook Schellenberg's (1926) drawing of *I. serrata* to show only a single dorsal process on pleonite 3. In his text however, Schellenberg clearly stated: "Die 2 letzten Meso- und die 3 Metasomsegmente tragen dorsal je ein Paar grosse, nach ruckwärts gerichtete, annähernd gerade Zahne" (1926:328). We have not yet examined specimens of either species and thus are hesitant to synonymize the two at this time.

Key to species of *Iphimediella*

- 1. Pleonites with enlarged mid-dorsal carinae, paired dorsal processes not prominent *I. imparidentata* (Bellan-Santini)
 - Pleonites with distinct paired dorsal processes 2
- 2. Without paired dorsal processes on pleonite 3 3
 - With paired dorsal processes on pleonite 3 5
- 3. Paired dorsal processes meet to form a "U" dorsally, pleonite 3 with slightly projecting keel *I. georgei*
 - Paired dorsal processes meet to form a "V" dorsally; pleonite 3 without a keel 4
- 4. Coxa 1 smoothly rounded anteroventrally, pereopod 7 basis broadly rounded behind, hind margin smooth; upper lip incised *I. bransfieldi* K. H. Barnard
 - Coxa 1 serrate or dentate below; pereopod 7 basis hind margin serrate and nearly parallel to anterior margin; upper lip entire *I. discoveryi* n. sp.
- 5. Paired dorsal processes on pereonites 6 and 7 and on pleonites 1–3 6
 - Paired dorsal processes on pereonite 7 and on pleonites 1–3 7
- 6. Coxa 1 ventral margin concave, coxae 4–7 ventral and posterior margins coarsely serrate, almost dentate .. *I. serrata* (Schellenberg)
 - Coxa 1 ventral margin straight, coxae 4–7 ventral and posterior margins finely serrate *I. octodentata* (Nicholls)
- 7. Coxa 7 posterior margin produced as an elongate process; pereopod 7 basis with 2 posterior teeth *I. acuticoxa* n. sp.
 - Coxa 7 smoothly rounded behind, at most with small tooth; per-

- eopod 7 basis smoothly rounded with single small tooth at postero-distal corner 8
8. Prominent medial tooth on antenna 1 peduncle article 1 extends well past third peduncle article; coxa 1 tapering distally, ventral margin narrowly bifid *I. margueritei* Chevreux
- Teeth on antenna 1 peduncle article 1 not extending past third article; coxa 1 not tapering, smooth at anteroventral corner 9
9. Paired dorsal teeth form a distinct “V” shape; mid-dorsal keel present on pleonites 1–3, additional upright keel present on urosomite 1 *I. rigida* K. H. Barnard
- Paired dorsal teeth do not form a “V” shape, no mid-dorsal keel present 10
10. Dorsal processes short, stubby; telson only shallowly emarginate; upper lip entire *I. microdentata* (Schellenberg)
- Dorsal processes elongate, slender; telson distinctly cleft; upper lip incised *I. cyclogena* K. H. Barnard

Iphimediella georgei n. sp.

Figs. 10, 11

Material.—Holotype: *Islas Orcadas* Cruise 19, Sta. 7, 8 Mar. 1979, 62°18.9'S, 55°13'W, 610 m, 1 ♀ (28 mm) with eggs (USNM 173587). Paratypes: *Eltanin* Cruise 27, Sta. 1924, 27 Jan. 1967, 75°11'S, 176°13'W, 728–732 m, 2 juveniles (USNM 173588).

Diagnosis.—Body with paired dorsal processes on pereonite 7 and pleonites 1 and 2; pleonite 3 with keel only, produced slightly backward into acute tooth; coxa 1 anteroventral margin rounded, posteroventral margin drawn downward into anteriorly directed hook.

Description.—Three pairs dorsal processes meet mid-dorsally to form smoothly rounded “U.” Urosomite 1 with prominent mid-dorsal carina. Head anterolateral sinus with acute tooth above and longer acute tooth below. Coxa 1 anteroventral margin smoothly rounded; ventral margin becomes distinctly concave before forming anteriorly directed hook (easily broken) at posteroventral margin. Coxae 2 and 3 similar in shape to coxa 1 but more slender, less rounded anteriorly and less concave ventrally. Antenna 1 peduncle article 1 with prominent tooth projecting ventrally past distal margin of peduncle article 2, with 2 smaller teeth projecting laterally along midline; peduncle article 2 with teeth projecting along each lateral margin past distal margin of article 3; accessory flagellum uniarticulate. Antenna 2 longer than antenna 1 in female. Upper lip distinctly incised. Mandible tapering, incisor toothed; molar prominent and setose; palp 3-articulate; accessory plate on right mandible toothed, left accessory plate not as well developed. Lower lip entire, apices smoothly rounded, inner

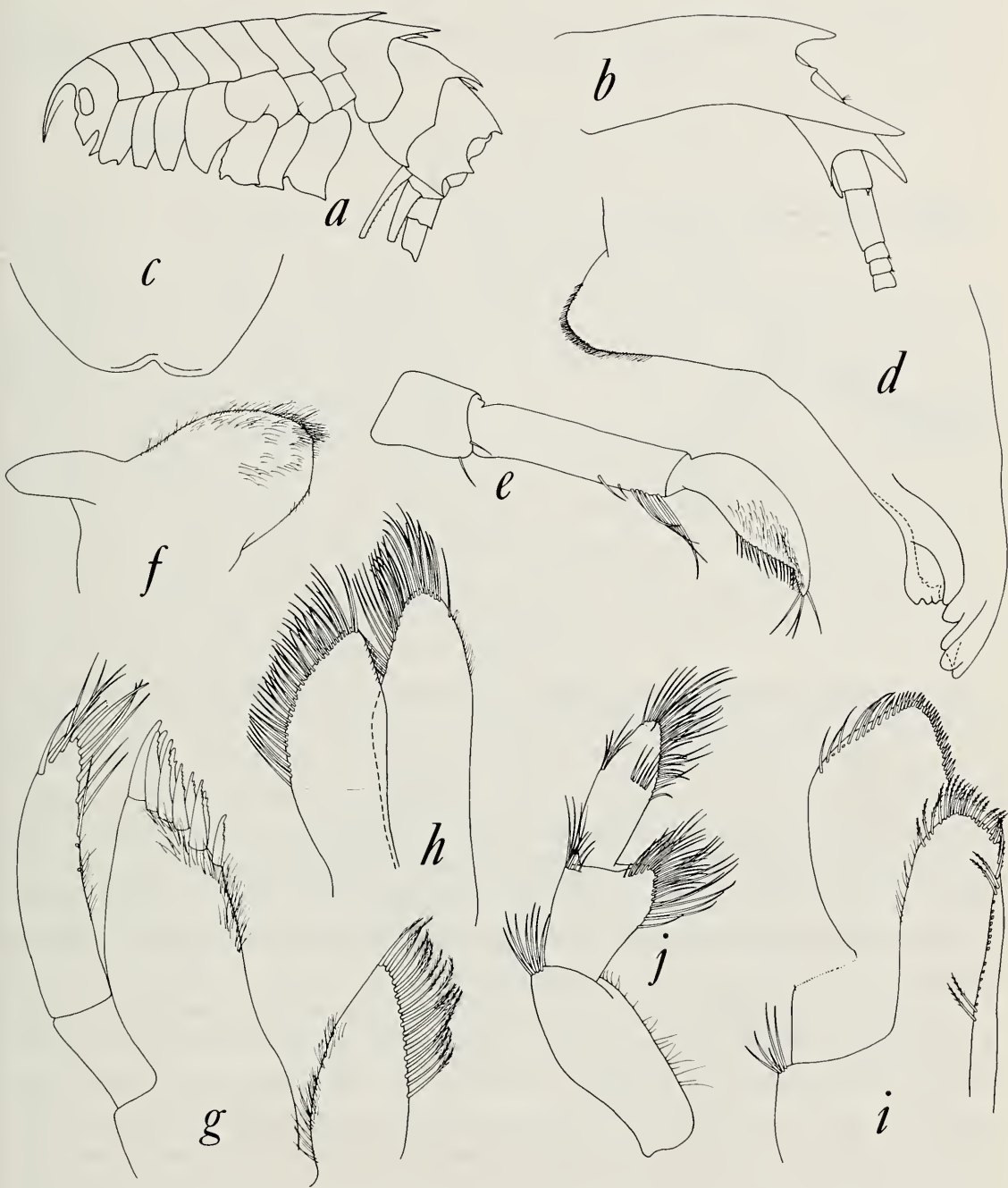


Fig. 10. *Iphimediella georgei*, female: a, Body, side view; b, Antenna 1 peduncle and basal flagellar articles; c, Upper lip; d, Mandible; e, Mandible palp; f, Lower lip; g, Maxilla 1; h, Maxilla 2; i, Maxilliped without palp; j, Maxilliped palp.

lobes absent. Maxilla 1 palp biarticulate, exceeding length of outer plate, setae half way along inner margin; inner plate subtriangular with 18 plumose setae on inner margin. Maxilla 2 inner and outer plates subequal in width; setae extend along medial margin of inner plate. Maxilliped palp 4-articulate with fourth article minute, covered by setose, hoodlike extension of article

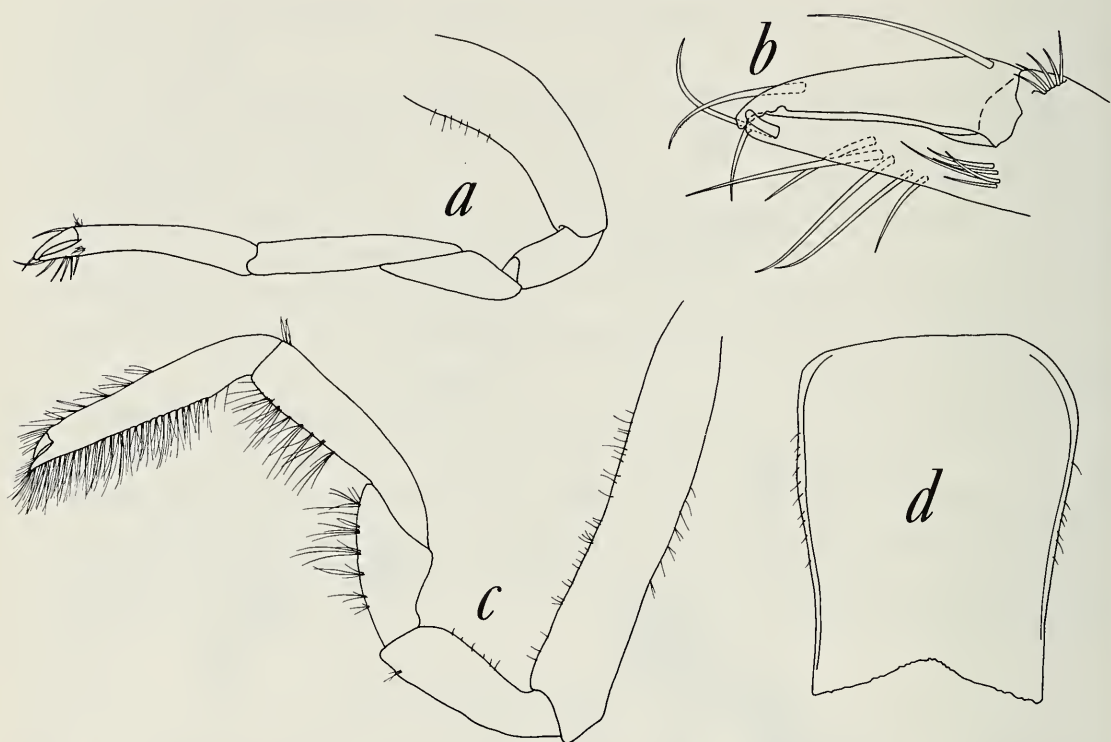


Fig. 11. *Iphimediella georgei*, female: a, Gnathopod 1; b, Gnathopod 1 propodus fixed finger and dactyl; c, Gnathopod 2; d, Telson.

3; palp article 2 distinctly expanded but not produced along article 3; palp article 3 longer than broad with plumose setae giving way to shorter, stouter setae along distal margin; inner plate with plumose setae along distal and medial margins. Gnathopods 1 and 2 chelate. Gnathopod 1 article 3 subequal to article 4 but less than $\frac{1}{2}$ length of article 6; article 5 subequal to article 6. Gnathopod 2 article 3 longer than article 4, $\frac{3}{4}$ length of article 6; article 5 subequal to article 6. Pereopods 5 and 6 basis posterior margin smoothly rounded proximally, drawn into a small tooth at posteroventral corner; posterior margin slightly serrate. Telson longer than wide, shallowly cleft; distal margin minutely irregular. Uropods 1 and 2 biramous. Uropod 1 peduncle longer than rami; outer ramus slightly shorter than inner. Uropod 2 peduncle slightly shorter than inner ramus; outer ramus shorter than inner. Uropod 3 either uniramous or missing inner ramus.

Etymology.—Named in honor of Dr. Robert Y. George.

Remarks.—This species can be easily distinguished by its dorsal armature. The only other *Iphimediella* species with 3 pairs of dorsal processes are *I. bransfieldi* and *I. discoveryi*. *I. georgei* differs from the latter 2 species in possessing a dorsal keel on pleonite 3. Additionally, the dorsal processes come together at the midline as a broadened “U” in *I. georgei* and as a “V” in *I. bransfieldi* and *I. discoveryi*. The mouthparts of *I. georgei* are

typically iphimeriellan with the expanded but not produced maxilliped palp article 2 being similar to that seen in *I. bransfieldi*.

Iphimeriella acuticoxa n. sp.

Figs. 12, 13

Material.—Holotype: *Eltanin* Cruise 12, Sta. 1003, 15 Mar. 1964, 62°41'S, 54°43'W, 210–220 m, 1 juvenile, 5 mm (USNM 173589).

Diagnosis.—Body with paired elongate dorsal processes on pereonite 7 and pleonites 1–3; lower lip notched apically; maxilla 1 palp as long as outer plate; pereopod 7 posterior margin excavate between 2 large teeth; coxae 5–7 hind margins acutely produced.

Description.—Head anteroventral corner with shallow sinus bounded by pair of subacute processes. Body with paired elongate dorsal processes on pereonite 7 and pleonites 1–3, last 2 pairs being somewhat upturned. Pleonite 3 with slight mid-dorsal keel. Pleurae of pereonites 5–7 extend outward as acute processes. Epimeral plates 1–3 each with lateral and distal teeth on posterior margins. Coxae 1 and 2 distally rounded; coxae 5–7 postero-distal corners acutely produced.

Antenna 1 peduncle article 1 with 2 short dorsal teeth on distal margin, without ventral tooth; peduncle article 2 with dorsal, ventral and lateral teeth distally. Upper lip narrowly rounded, entire. Mandible elongate, with accessory plate on both left and right sides; molar a short, setose, flat-topped protuberance; palp article 2 with single distal seta, article 3 with covering of fine setae, longer setae on distal third of article. Lower lip with apical notch. Maxilla 1 palp biarticulate, exceeding outer plate, article 2 twice length of article 1; inner plate more than half length of outer plate, with 7 strong, plumose setae distally; outer plate with 5 stout setae at apex. Maxilla 2 inner and outer plates subequal in width; outer plate with long, simple setae at apex slightly longer than those on inner. Maxilliped palp 4-articulate, article 2 expanded but not produced along article 3, latter long and slender; palp article 1 only slightly longer than article 2, article 4 minute; outer and inner plates apically subacute; inner plate with setae only on distal half of medial margin.

Gnathopod 1 chelate, generally devoid of setae; dactyl partly fused to propodus; propodus finger bears 5 long plumose setae with backwardly-directed setules. Gnathopod 2 subchelate; article 6 longer than article 5, both articles sparsely setose; dactyl and fixed finger of propodus equal in size and shape. Pereopods 5–7, basis posterior margin excavate between dorsal and ventral teeth. Uropod 1 rami weak, outer ramus unarmed. Uropod 2 outer ramus shorter than inner. Telson shallowly V-cleft, with 2 terminal pairs of setae.

Etymology.—The name refers to the shape of coxa 7.

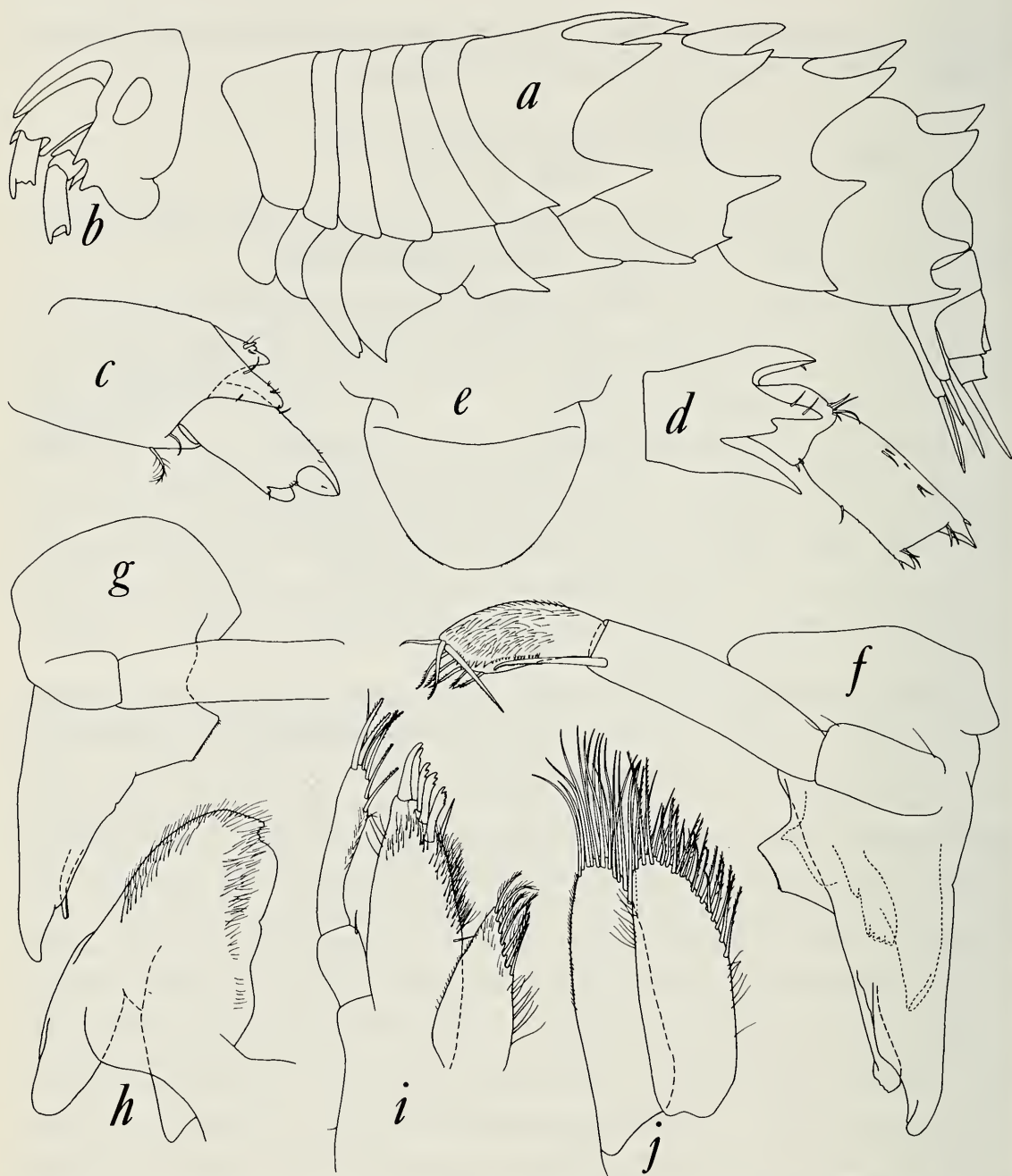


Fig. 12. *Iphimediella acuticoxa*, juvenile: a, Body, side view; b, Head; c, Antenna 1 peduncle articles 1 and 2; d, Antenna 2 peduncle articles 2-4; e, Upper lip; f, Left mandible with palp; g, Right mandible; h, Lower lip; i, Maxilla 1; j, Maxilla 2.

Distribution.—Known only from locality listed above.

Remarks.—This species is unique in the genus with respect to the acutely produced hind margins of coxae 5-7. Maxilliped palp article 2 is expanded medially and slightly produced; however the overall aspect of the palp is more closely related to several other *Iphimediella* species than it is to species of *Iphimedia*.

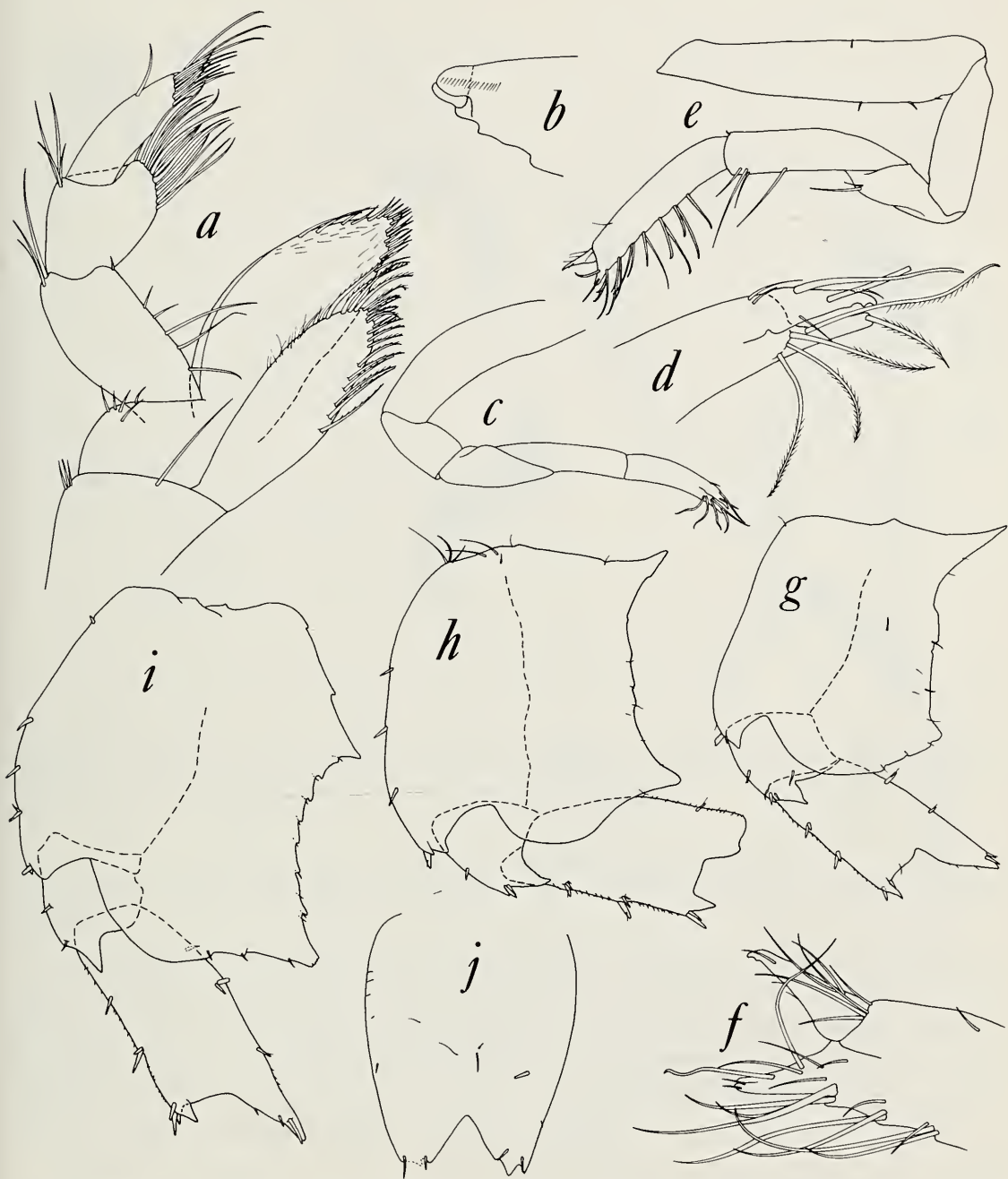


Fig. 13. *Iphimediella acuticoxa*, juvenile: a, Maxilliped; b, Maxilliped distal end of article 3 and minute article 4, seta omitted; c, Gnathopod 1; d, Gnathopod 1 propodus fixed finger and dactyl; e, Gnathopod 2; f, Gnathopod 2 propodus fixed finger and dactyl; g, Pereopod 5; h, Pereopod 6; i, Pereopod 7; j, Telson.

Iphimediella bransfieldi Barnard 1932
Figs. 14, 15

Iphimediella bransfieldi Barnard, 1932:119 (part).—Nicholls, 1938:70, fig. 37J.



Fig. 14. *Iphimediella bransfieldi*, female: a, Body, side view; b, Head; c, Antenna 1 peduncle and uniarticulate accessory flagellum; d, Upper lip; e, Mandible; f, Lower lip; g, Maxilla 2.

Material.—*Discovery* Sta. 175, 2 Mar. 1927, 63°17'S, 59°48'W, 200 m (BMNH No. 1936. 11. 2. 1080–1081) 1 ♀ ovigerous, 22 mm (lectotype). *Eltanin* Cruise 51, Sta. 5761, 8 Feb. 1972, 76°01.6'S, 179°49.9'E, 388–399 m, 1 ♀, with eggs, 22 mm.

Diagnosis.—Body with short, paired dorsal processes on pereonite 7 and pleonites 1 and 2; antenna 1 peduncle article 2, ventrodiscal tooth longer

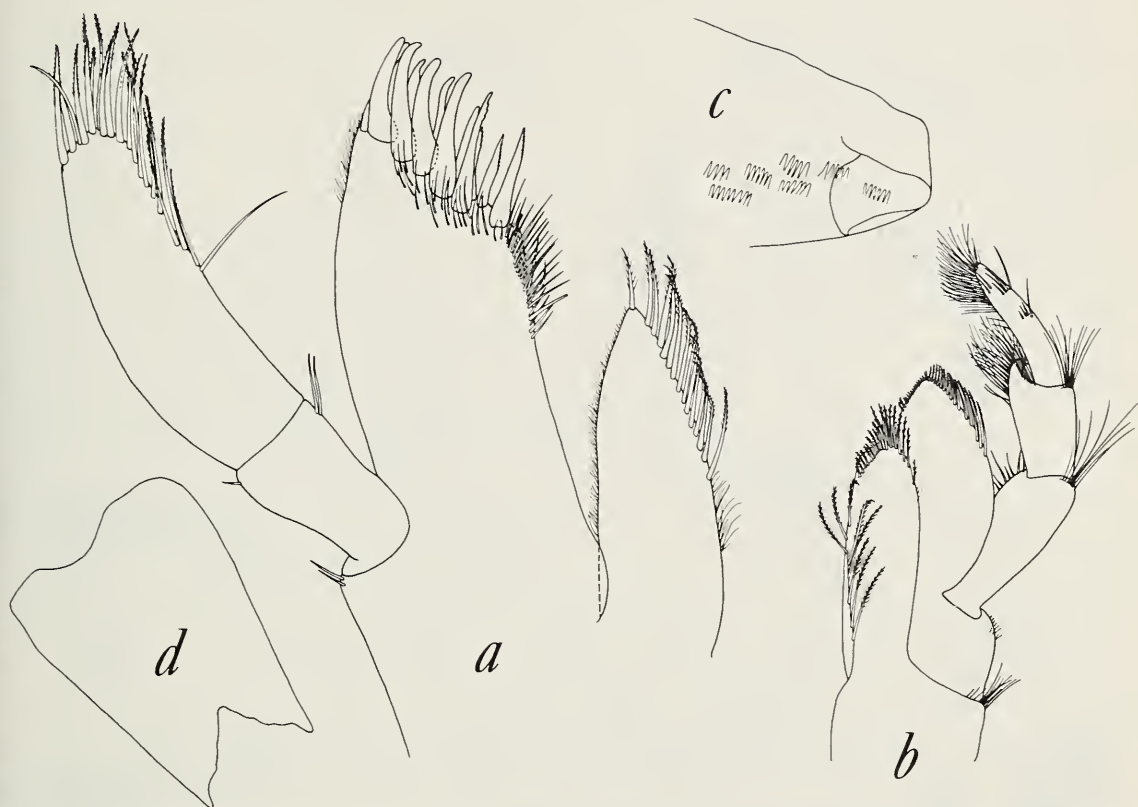


Fig. 15. *Iphimediella bransfieldi*, female: a, Maxilla 1; b, Maxilliped; c, Maxilliped distal end of article 3 and minute article 4, seta omitted; d, Telson.

than dorsal tooth; coxae 1–4 anteroventral margins smooth; upper lip emarginate.

Description.—The following supplements the description given by Barnard (1932). Body with short, wide dorsal processes on pereonite 7 and pleonites 1 and 2, each pair forms distinct “V” dorsally; urosomite 1 without mid-dorsal carina. Head anterolateral margin with narrow sinus bounded below by short tooth; rostrum shorter than antenna 1 first peduncle article. Coxa 1 anteroventral corner broadly rounded.

Antenna 1 peduncle short, ventrodistal tooth on first article with 2 short accessory teeth; peduncle article 2, ventral tooth longer than dorsal; accessory flagellum uniarticulate. Upper lip slightly incised, ventrolateral margins with dense covering of short hairs. Right mandible incisor and accessory plate multidentate; molar conical, strong, with apical tuft of short hairs. Lower lip apically narrow, without inner lobes. Maxilla 1 palp article 2 elongate, armed along distal half of inner margin; outer plate subrectangular, distal edge with strong spines, medial edge setose distally; inner plate subacute, distal half of medial margin with short plumose setae. Maxilla 2 inner and outer plates longer than wide. Maxilliped outer plate subovate, unarmed along proximal half of lateral margin; palp with 4 articles, the last minute,



Fig. 16. *Iphimediella discoveryi*, female: a, Body, side view; b, Head; c, Antenna 1 peduncle articles and accessory flagellum; d, Upper lip; e, Right mandible; f, Left mandible; g, Lower lip; h, Maxilla 1; i, Maxilla 2; j, Maxilliped.

detectable only at high magnification, partly covered by hoodlike extension of article 3; palp article 3 longer than article 2, subequal in length to article 1. Telson with broad V-shaped cleft, apices acute.

Distribution.—South Shetland Islands, approximately 200 m.

Remarks.—K. H. Barnard (1932) briefly described, but did not illustrate,



Fig. 17. *Iphimediella discoveryi*, female: a, Gnathopod 1; b, Gnathopod 2; c, Pereopod 5; d, Telson distal margin.

this species from 2 ovigerous syntypes collected off the South Shetland Islands. In his description he noted that the smaller of the 2 specimens differed somewhat from the larger. We have examined both specimens and found them to differ considerably, especially in their mouthpart morphology. Since the smaller of the 2 specimens seemed to represent to K. H. Barnard exceptions to the typical *I. bransfieldi*, we have chosen it as the holotype of a new species, *I. discoveryi*, which is described below. The larger specimen becomes the lectotype of *I. bransfieldi*.

Iphimediella discoveryi n. sp.

Figs. 16, 17

Iphimediella bransfieldi Barnard, 1932:119 (part).

Material.—Holotype: *Discovery* Sta., 175, 2 Mar. 1927, 63°17'S, 59°48'W, 200 m (BMNH No. 1936. 11. 2. 1080–1081), 1 ♀ ovigerous, 14 mm. Paratype: *Eltanin* Cruise 12, Sta. 1003, 15 Mar. 1964, 62°41'S, 54°43'W, 210–220 m, 1 juvenile.

Diagnosis.—Body with short, paired dorsal processes on pereonite 7 and pleonites 1 and 2 meeting to form “V” dorsally; antenna 1 peduncle article 2 dorsodistal tooth longer than ventral; coxae 1–4 anteroventral margins and pereopods 5–7 basis hind margin serrate; upper lip entire.

Description.—Body with short, paired dorsal processes on pereonite 7 and pleonites 1 and 2; processes meet mid-dorsally to form a “V”; urosomite 1 without mid-dorsal carina. Head anterolateral margin with shallow sinus bounded below by long, acute tooth. Coxa 1 tapering, anteroventral corner not rounded, ventral margin slightly concave, serrate.

Antenna 1 peduncle article 2 with dorsal tooth longer than ventral. Upper lip broadly rounded with setae along ventral margin. Mandible stout relative to *I. bransfieldi*; molar a slight, setose protuberance; accessory plate on left mandible toothed, on right mandible smooth. Lower lip apically truncate, without inner lobes. Maxilla 1 palp article 2 armed with hairlike setae along most of inner margin; outer and inner plates similar to *I. bransfieldi*. Maxilliped palp with minute article 4; palp article 2 nearly as wide as long; article 3 longer than article 2, article 1 longer than article 3; outer plate as broad as long, distal margin with elongate plumose setae. Pereopod 5 basis anterior and posterior margins parallel, posterior and ventral margins serrate. Telson shallowly cleft, apices rounded.

Etymology.—The species is named in honor of the R.R.S. *Discovery*.

Distribution.—Antarctic Peninsula, 200–220 m.

Remarks.—The form and number of paired dorsal processes on the body gives this species the appearance of *I. bransfieldi*. The following features, however, readily distinguish the two: 1) coxal plates 1–4 anteroventral margins and pereopod 5–7 basis hind margins serrate in *I. discoveryi* and smooth in *I. bransfieldi*; 2) pereopod 5 basis much less expanded in *I. discoveryi* than in *I. bransfieldi*; 3) antenna 1 peduncle article 2 dorsal tooth longer than ventral in *I. discoveryi* whereas the reverse is the case in *I. bransfieldi*; 4) upper lip ventral margin entire in *I. discoveryi* and emarginate in *I. bransfieldi*; 5) telson apices rounded in *I. discoveryi* and subacute in *I. bransfieldi*.

Iphimediella cyclogena Barnard 1930

Figs. 18, 19

Iphimediella cyclogena Barnard, 1930:349, fig. 23.

Iphimediella intermedia Nicholls, 1938:71, fig. 37 (new synonymy).

Material.—*Eltanin* Cruise 12, Sta. 1002, 15 Mar. 1964, 62°40'S, 54°44'–45'W, 265 m, 1 ♀; *Eltanin* Cruise 12, Sta. 1003, 15 Mar. 1964, 62°41'S, 54°43'W, 210–220 m, 3 ♂♂. *Terra Nova* Sta. 4 (194?) (BMNH No. 1930.8.1: 180–182) (Oates Land?).

Diagnosis.—Body with 4 pairs elongate, smooth dorsal processes; coxa 1 anteroventral corner narrowly rounded, ventral margin concave; coxae 2 and 3 tapering distally, posteroventral corner produced ventrally; antenna 1 peduncle article 1 ventrodorsal tooth extends beyond distal margin of peduncle article 2; head lateral margin with narrow notch bounded above by sharp point and below by blunt lobe.

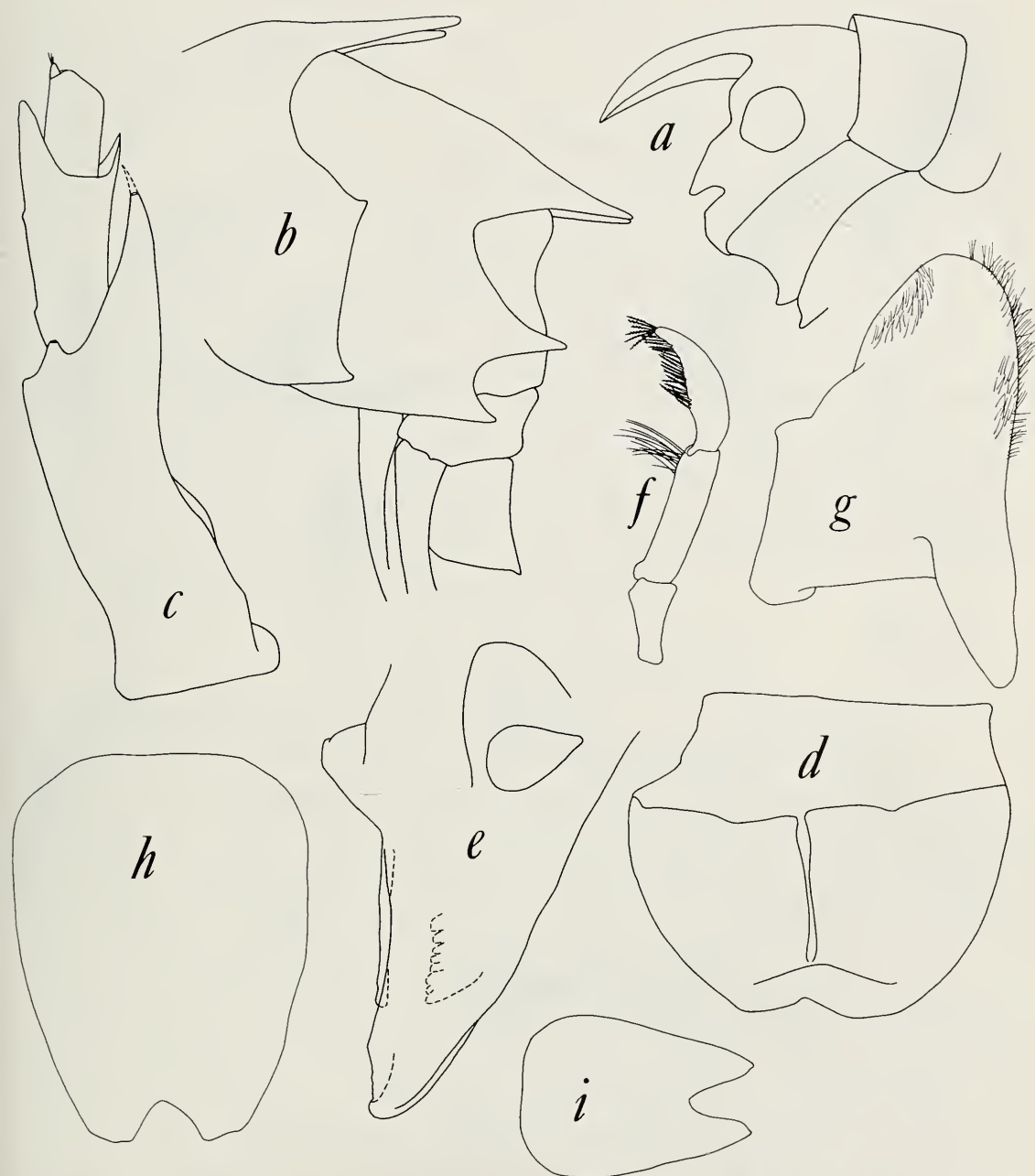


Fig. 18. *Iphimediella cyclogena*, Terra Nova specimen, male: a, Head and coxa 1; b, Pleonites 2, 3 and urosome; c, Antenna 1 peduncle and accessory flagellum; d, Upper lip; e, Mandible; f, Mandible palp; g, Lower lip; h, Telson. Male, *Eltanin* Sta. 1003; i, Telson.

Description.—The following supplements the description given by K. H. Barnard (1930). Antenna 1 with minute accessory flagellum. Upper lip slightly incised. Mandible molar with small apical tuft of short hairs. Lower lip without inner lobes. Maxillae 1 and 2 similar to *I. bransfieldi*. Maxilliped palp article 4 minute, as wide as high, covered by hoodlike extension of article 3; article 2 shorter than articles 1 and 3, only slightly produced me-



Fig. 19. *Iphimediella cyclogena*, Terra Nova specimen, male: a, Maxilla 1; b, Maxilla 2; c, Maxilliped; d, Gnathopod 1; e, Gnathopod 1 propodus fixed finger and dactyl; f, Gnathopod 2; g, Gnathopod 2 propodus and dactyl, setae omitted.

dially. Gnathopod 1 chelate, sparsely setose; dactyl overhangs fixed finger of propodus. Gnathopod 2 chelate, setose along ventral margin of articles 4, 5 and 6; dactyl shorter than fixed finger of propodus. Telson shallowly cleft.

Distribution.—Shelf off tip of Antarctic Peninsula, Oates Land, Ross Sea, Adelie Coast, 329–540 m.

Remarks.—We compared the illustrations of *I. cyclogena* given by K. H. Barnard (1930:350) with specimens borrowed from the British Museum and found the following variations: 1) coxa 1 as illustrated appeared to be sharply angled at the anteroventral corner, however, all specimens we examined had a rounded anteroventral corner; 2) the length of the dorsal processes on pleonite 3 were proportionately longer and slightly upturned in smaller versus larger specimens; 3) the head lateral margin as illustrated appeared to be very diagrammatic since the lobe below the sinus is actually much less rounded; 4) the shape of the telson differed from specimen to specimen. Nicholls (1938:73) distinguished *I. intermedia* from *I. cyclogena* using “the shape of the head, of the first coxal plate, outline of pereon segment 7 and pleon segments 1–3, in proportions and other details of peduncular joints of first and second antennae and the presence of secondary cutting plates on both mandibles.” For all specimens of *I. cyclogena* we examined, the above characters had to be rejected either on the basis of overall variability or because of incorrect interpretation of the illustrations. Thus we conclude that *I. intermedia* is a synonym of *I. cyclogena*.

Pseudiphimediella Schellenberg

Pseudiphimediella Schellenberg, 1931:119.

Pariphimediella Schellenberg, 1931:121 (part) (new synonymy).

Type-species.—*Amphitoe nodosa* Dana, 1853 (original designation).

Diagnosis.—Upper lip incised or sinuous; epistome not more than 3 times as wide as high; mandible incisor broad, thin-edged, multi-toothed, and curved toward midline so as to cut in the frontal plane; maxilliped palp article 2 broadened, not produced, outer plate broad.

Remarks.—Schellenberg (1931) distinguished *Pseudiphimediella* from *Pariphimediella* on the basis of the former possessing a deeply incised upper lip and broadened articles 1 and 2 on the maxilliped palp. As discussed under the remarks for *Iphimediella*, Schellenberg's *P. glabra* differs from other *Iphimediella* species (*sensu* Karaman and J. L. Barnard, 1979) but is similar to *Pseudiphimediella nodosa* in possessing mouthparts with a broadened aspect and, more significantly, in the orientation of the mandible incisor which cuts in the frontal plane. The genus *Pseudiphimediella* as presently defined thus contains the 2 species *P. nodosa* (Dana) and *P. glabra* (Schellenberg).

Pseudiphimediella glabra (Schellenberg, 1931) new combination

Fig. 20

Pariphimediella glabra Schellenberg, 1931:121, fig. 65; pl. 1, fig. B.

Material.—Eltanin Cruise 9, Sta. 740, 18 Sept. 1963, 56°06–07'S, 66°19–



Fig. 20. *Pseudiphimediella glabra*, female: a, Body, side view; b, Head; c, Antenna 1 peduncle ventral view; d, Antenna 1 peduncle dorsal view; e, Mandible; f, Mandible palp; g, Lower lip; h, Maxilla 1; i, Maxilliped; j, Gnathopod 2 propodus fixed finger and dactyl; k, Pereopod 6; l, Pleonite 3 and urosomites 1 and 2; m, Telson.

30'W, 384–494 m, 1 ♀ with eggs, 2 ♂♂; *Eltanin* Cruise 11, Sta. 977, 13 Feb. 1964, 52°32'S, 63°53'W, 229 m, 1 ♀ with eggs, 2 ♂♂, 1 juvenile.

Diagnosis.—Body with paired dorsal processes on pereonites 6 and 7 and pleonites 1–3; urosomite 1 with strong mid-dorsal keel; maxilla 1 inner plate with 9–10 stout plumose setae; maxilliped inner plate medial margin armed with several setae.



Fig. 21. *Pseudiphimediella nodosa*, female: a, Mandible; b, Maxilla 1; c, Maxilliped.

Description.—The following supplements the description given by Schellenberg (1931). Antenna 1 peduncle article 1 with 3 teeth along distal margin, 2 ventral and 1 lateral. Mandible shortened, with broad, thick incisor; accessory plate with elongate cutting edge; palp article 3 half length of article 2, armed along distal half of ventral margin. Lower lip distal apex broadened, sinuous. Maxilla 1 palp biarticulate, reaching beyond distal half of medial margin; outer plate subrectangular; inner plate armed with short, stout plumose setae. Maxilliped palp 4-articulate, article 3 apex extended slightly covering minute fourth article (seen using SEM); article 2 expanded medially but only slightly along article 3, outer plate broadly ovate, armed with stout plumose setae. Gnathopods 1 and 2 chelate; fixed finger of gnathopod 2 propodus much wider than dactyl, heavily armed with setae.

Distribution.—Burdwood Bank, Falkland Islands and Magellanic area, 2–494 m.

Remarks.—The specimens examined by us differed from the illustrations of Schellenberg (1931) in the following features: mid-dorsal keel on urosomite 1 varied considerably in size; pereopod 6 basis hind margin lower corner was without a tooth; coxa 1 was more rounded distally.

Pseudiphimediella nodosa (Dana, 1853)
Fig. 21

Iphimedia nodosa Dana, 1853–55:928, pl. 63, figs. 3A, B.
Pseudiphimediella nodosa: Schellenberg, 1931:119, fig. 64, pl. 1, fig. A.
Iphimediella nodosa: K. H. Barnard, 1932:119, fig. 67.

Material.—William Scoresby Sta. 85, 25 March 1927, 8 mi. S, 66°E of Lively Island, East Falkland Island, 79 m, 1 ♀ with young (BMNH 1936. 11. 2. 1082).

Diagnosis.—Body with paired dorsal processes on pereonite 7 and pleonites 1–3; urosomite 1 with mid-dorsal keel; maxilla 1 inner plate with few, elongate plumose setae; maxilliped inner plate medial margin unarmed.

Description.—The following supplements the descriptions given by Schellenberg (1931) and K. H. Barnard (1932). Right mandible with small accessory plate; incisor spoon-shaped, multitoothed; mandible oriented such that incisors move in frontal plane; palp article 2 elongate, with 2 setae on distal corner. Maxilla 1 inner plate weakly armed; palp article 2 broad. Maxilliped palp article 4 minute, covered by hoodlike extension of article 3; palp article 2 broadened, not produced; inner plate medial margin weakly armed.

Distribution.—Falkland Islands, Magellanic region; low tide to 150 m.

Remarks.—The illustrations given by Schellenberg (1931) for this species are extremely diagrammatic and do not contain the information critical for evaluating its relationships. On examination of British Museum material we found that the maxilliped palp articles 1 and 2 were not appreciably broadened compared to some species of *Iphimediella* and *Gnathiphimedia*. *P. nodosa* was, however, very distinct in the shape and orientation of the mandible. We have looked at mandible orientation in several genera of Acanthonotozomatidae and conclude that several generic complexes can be discerned using this feature. The mandible incisors of *Pseudiphimediella* and *Maxilliphimedia* are oriented such that they meet and thus cut or pinch along the frontal plane of the head, which is the condition typical of most gammaridean anphipods. *Gnathiphimedia*, *Iphimediella* and most species of *Iphimedia* have mandible incisors that are oriented to cut along the transverse plane of the head. It is this orientation which has led to the description of acanthonotozomatid mouthparts as being arranged in a “conical bundle.” Within the transversely biting mandible group there is some variation in the form of the incisor, for example, in *Gnathiphimedia* the thickened, smoothly rounded incisor edge apparently functions in a “crushing” mode while the blade-like incisor of *Iphimediella* probably functions in a cutting mode.

Paramphithoidae

Epimeria Costa

Epimeria Costa in Hope, 1851:46.

Pseudepimeria Chevreux, 1911:1167 (new synonymy).

Subepimeria Bellan-Santini, 1972:225.

Type-species.—*Gammarus corniger* J. C. Fabricius 1779.

Diagnosis (emended from J. L. Barnard, 1969).—Rudimentary accessory flagellum; mandible molar large, ridged; lower lip lacking inner lobes; max-

illiped palp 4-articulate; gnathopods simple or subchelate, dactyls often spinose, much shorter than propodus; coxae 4–5 together forming a more or less crescentic curve below.

Remarks.—As pointed out by Karaman and Barnard (1979) the characters used by Bellan-Santini (1972) to establish the genus *Subepimeria* (presence of uniarticulate accessory flagellum, simple gnathopods) were not distinctive at the generic level. All species of *Epimeria* examined in this study have been found to have an uniarticulate accessory flagellum. Karaman and Barnard (1979) also suggested that *E. geodesiae* (Bellan-Santini) showed very weak gnathopodal palms and thus were not, in fact, simple. Weak palms are also found in *E. puncticulata* K. H. Barnard. These latter species intergrade to the true simple gnathopod seen in *Pseudepimeria* Chevreux, leaving no characters by which *Pseudepimeria* and *Epimeria* can be distinguished.

Epimeria rimicarinata n. sp.

Figs. 22, 23

Material.—Holotype, *Eltanin* Cruise 27, Sta. 1875, 15 Jan. 1967, 72°32'S, 171°26–28'E, 337–329 m, 1 non-ovigerous ♀, 35 mm (USNM 173590); paratype, Cruise 32, Sta. 2080, 31 Jan. 1968, 75°50–52'S, 173°08'W, 468–474 m, 1 ♂, 35 mm (USNM 173591).

Diagnosis.—Body with mid-dorsal carinae on pereonites 3–7, pleonites 1–3 and urosomites 1 and 2, those on pereonites 5–7, pleonites 1–3 and urosomite 1 distinctly cleft into anterior and posterior teeth; pereonites 5–7, pleonites 1–3 and urosomite 1 with dorsolateral carinae; coxa 4 broadly quadrate ventrally, posteroventral corner slightly produced; coxa 5 posteroventral corner slightly, bluntly produced.

Description.—Body bluntly processiferous. Mid-dorsal carinae on pereonites 3–7, pleonites 1–3 and urosomites 1 and 2, those on pereonites 5–7, pleonites 1–3 and urosomite 1 distinctly cleft into 2 consecutive posteriorly-directed teeth. Pereonites 5–7, pleonites 1–3 and urosomite 1 with small dorsolateral carinae. Pleonites 1–3 and urosomite 1 each bear one additional lateral protuberance anteriorly. Coxae 1–3 narrowly subrectangular with anteroventral corners rounded, posteroventral corners angular. Coxa 4 ventral margin broadly quadrate, posteroventral corner slightly produced. Coxa 5 posteroventral margin bluntly produced. Rostrum long, strongly curved ventrally, extending beyond antenna 1 peduncle article 1. Antenna 1 shorter than antenna 2 in both sexes, with uniarticulate accessory flagellum; peduncle article 1 twice length article 2, with several small teeth on mediodistal margin. Upper lip incised, lobe apices setose. Mandible molar large, crushing ("tritulative"); incisor multidentate; left lacinia mobilis multidentate, right lacinia mobilis bidentate; palp articles 2 and 3 subequal, heavily setose. Lower lip entire, without inner lobes. Maxilla 1 inner plate subtriangular with 9 apical plumose setae; outer plate with 14 slender spines on distal



Fig. 22. *Epimeria rimicarinata*, female: a, Body, side view; b, Antenna 1; c, Upper lip; d, Mandible; e, Mandible palp; f, Lower lip; g, Maxilla 1; h, Maxilla 2.

margin; palp article 2 distally armed with short, stubby spines extending proximally along $\frac{1}{3}$ inner margin, grading into fine setae. Maxilla 2 inner and outer plates approximately equal in width, heavily setose along distal margins. Maxilliped inner plate with plumose setae along medial and distal margins; outer plate with nonplumose setae distally, short submarginal spines medially; palp 4-articulate, article 2 longest; palp article 4 with 8 slender spines on inner margin. Gnathopods subchelate, similar, gnathopod



Fig. 23. *Epimeria rimicarinata*, female: a, Maxilliped, without palp; b, Maxilliped palp; c, Gnathopod 1; d, Gnathopod 2; e, Gnathopod 2 propodus and dactyl; f, Pereopod 5; g, Pereopod 6; h, Pereopod 7; i, Telson.

1 slightly smaller than gnathopod 2, articles 5 longer than articles 6; dactyls with numerous spines on inner margin. Pereopod 5 basis with small proximal lobe on posterior margin, distal $\frac{2}{3}$ posterior margin parallel to anterior margin. Pereopods 6 and 7 proximal lobes of basis posterior margins successively enlarged, producing incised appearance. Telson cleft $\frac{1}{4}$, setae on apices.

Etymology.—The name is derived from the Latin *rima* = cleft and *carina* = keel.

Distribution.—Known only from the Ross Sea.

Remarks.—This species is most easily distinguished by the cleft mid-dorsal carinae, a feature thus far unique in the genus.

Parepimeria Chevreux

Parepimeria Chevreux, 1912:1168.

Parepimeriella Schellenberg, 1931:165 (new synonymy).

Type-species.—*Parepimeria crenulata* Chevreux, 1912.

Diagnosis.—Antenna 1 with uniarticulate accessory flagellum; mandible with large, ridged molar; lower lip with inner lobes; maxilliped palp 4-articulate, article 3 not produced distally, inner plate not reaching palp article 2; gnathopods similar; telson entire.

Remarks.—The generic diagnosis has been modified to include a 4-articled palp on the maxilliped, a feature which Chevreux evidently did not see due to the dense cover of setae distally on article 3. Schellenberg (1931) distinguished *Parepimeriella* from *Parepimeria* on the basis of its rudimentary rostrum, widely separated outer lobes of the lower lip, and broadly rounded distal margin of gnathopod 2 coxa. Barnard (1932) pointed out the variable nature of the rostrum length; the other 2 characters are differences only of degree as evidenced by the new species described herein. The genus as now constituted contains the following species: *P. crenulata* Chevreux 1912, *P. bidentata* Schellenberg 1931, *P. irregularis* (Schellenberg 1931); *P. major* K. H. Barnard 1932; and *P. minor* n. sp.

Key to species of *Parepimeria*

- 1. Rostrum deflexed, not extending along article 1 of antenna 1 2
- Rostrum extends out in front of head, at least to half length of antenna 1 article 1 4
- 2. Epimeral plate 3 posterior margin tooth 3
- Epimeral plate 3 posterior margin smooth . . *P. major* K. H. Barnard 1932
- 3. Coxa 2 distal margin broadly rounded
- *P. irregularis* (Schellenberg 1931)
- Coxa 2 distal margin narrowly rounded *P. minor* n. sp.
- 4. Last 3 pereon segments with mid-dorsal and pair of sub-dorsal carinae *P. crenulata* Chevreux 1912
- Last 3 pereon segments lacking mid-dorsal carina
- *P. bidentata* Schellenberg 1931

Parepimeria bidentata Schellenberg

Fig. 24

Parepimeria bidentata Schellenberg, 1931:164.*Parepimeria crenulata* K. H. Barnard, 1932:179 (part).

Material.—*Eltanin* Cruise 12, Sta. 1003, 15 Mar. 1964, 62°41'S, 54°43'W, 210–220 m, 5 spec.; *Discovery* Sta. 42, 1 April 1926, off mouth of Cumberland Bay, South Georgia, 120–204 m, 1 ♂, 12 ♀♀; *Isla Orcadas* Cruise 19, Sta. 27, 29 Mar. 1979, 53°57'S, 36°08'W, 180 m, 1 ♀ with eggs.

Diagnosis.—Rostrum long, extending horizontally outward from head; body with paired dorsolateral processes on pereonites 3 to 7; pleonites 1 and 2 with backwardly-directed mid-dorsal carinae; pleonite 3 with acute mid-dorsal tooth; epimeral plate 3 posterior margin serrate; maxilliped palp article 4 strong; gnathopods 1 and 2 dactyl shorter than propodus.

Description.—Body with paired sub-dorsal carinae on pereonites 3–7, increasing in length posteriorly; pleural tubercles pronounced on pereonites 4–6; pleonites 1–3 with mid-dorsal carinae, the first two posteriorly-directed, the last recurved anteriorly; posterior margin of epimeral plates 2 and 3 strongly serrate; coxa 1 anteroventral corner subacutely produced anteriorly, posteroventral corner rounded, ventral margin slightly serrate; coxa 3 anteroventral corner bluntly produced downward; coxa 4 narrowly rounded distally. Rostrum long, extending beyond distal end of antenna 1 peduncle article 1, often beyond distal end of peduncle article 2; head angle subacute; eyes large, protruding from side of head. Antenna 1 with uniarticulate accessory flagellum; peduncle articles 1–3 subequal in length; peduncle and flagellar articles bear ventrally-directed long, thin setae. Antenna 2 longer than antenna 1; peduncle article 5 slightly longer than article 4. Mandible with strong, triturative molar; left lacinia mobilis with approximately 4 teeth, right lacinia mobilis bifid; palp articles 2 and 3 elongate, approximately 5 times as long as wide; both articles armed ventrally throughout their length with long stiff setae. Maxilla 1 palp with subapical group of setae; inner plate with 3 terminal setae, outer plate with 7. Maxilla 2 inner and outer plates terminally rounded, outer plate without setae along medial margin. Maxilliped with 4-articulate palp; palp terminal article slender, spinelike, three-fourths length of article 3; article 3 with dense terminal cluster of setae; outer plate reaches less than half length of palp article 2, not falciform; inner plate short, reaching only to end of first palp article.

Gnathopod 1 simple; dactyl greater than half length of article 6, slender, spiniform; articles 5 and 6 subequal in length; article 5 proximally expanded, with 2 rows of ventrally-directed, long, stiff setae, one medial, the other along ventral margin. Gnathopod 2 similar to gnathopod 1, but articles 5 and 6 more elongate. Pereopods 5 and 6 basis subrectangular, posteroventral

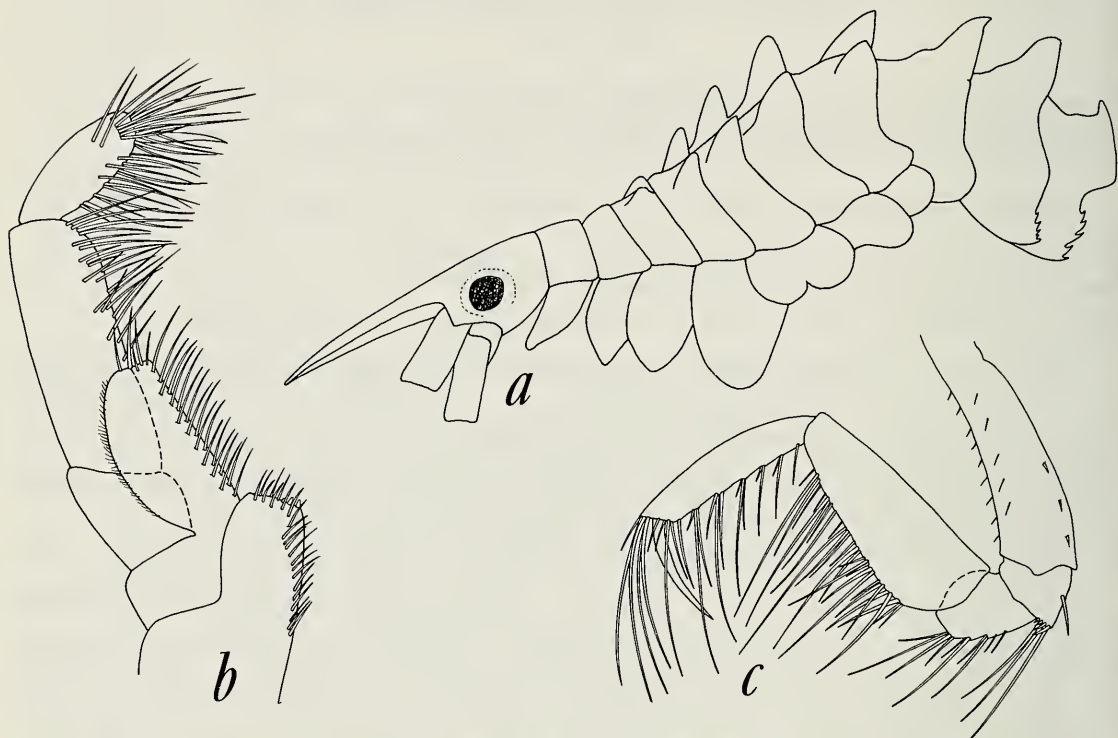


Fig. 24. *Parepimeria bidentata*, female: a, Body, side view; b, Maxilliped; c, Gnathopod 1.

corner extended as a lobe. Pereopod 7 basis tapers distally. Uropods 1–3, outer ramus shorter than inner. Telson entire, broadly rounded.

Distribution.—Shelf off Joinville Island (Antarctic Peninsula), Shag Rocks, South Georgia.

Remarks.—In most details, especially with respect to the mouthparts, *P. bidentata* and *P. crenulata* are very similar. Chevreux (1912) did not record an article 4 on the maxilliped palp but since it is difficult to see in other species, it is likely that it escaped Chevreux's notice. The major difference between *P. bidentata* and *P. crenulata* then, becomes the presence of a mid-dorsal carina on pereonites 2–7 in *P. crenulata* which is lacking in *P. bidentata*. We re-examined the specimens from *Discovery* Station 42 (Barnard 1932) and found them to correspond to the description of *P. bidentata* rather than *P. crenulata* as determined by K. H. Barnard. It is not known whether the remainder of the material examined by K. H. Barnard also is *P. bidentata*.

Parepimeria minor n. sp.

Fig. 25

Material.—*Eltanin* Cruise 6, Sta. 410, 31 Dec. 1962, 61°18–20'S, 56°09–10'W, 220–240 m, 3 spec., 5.0 mm holotype (USNM 173592); 4.0 mm and 2.0 mm paratypes (USNM 173593).

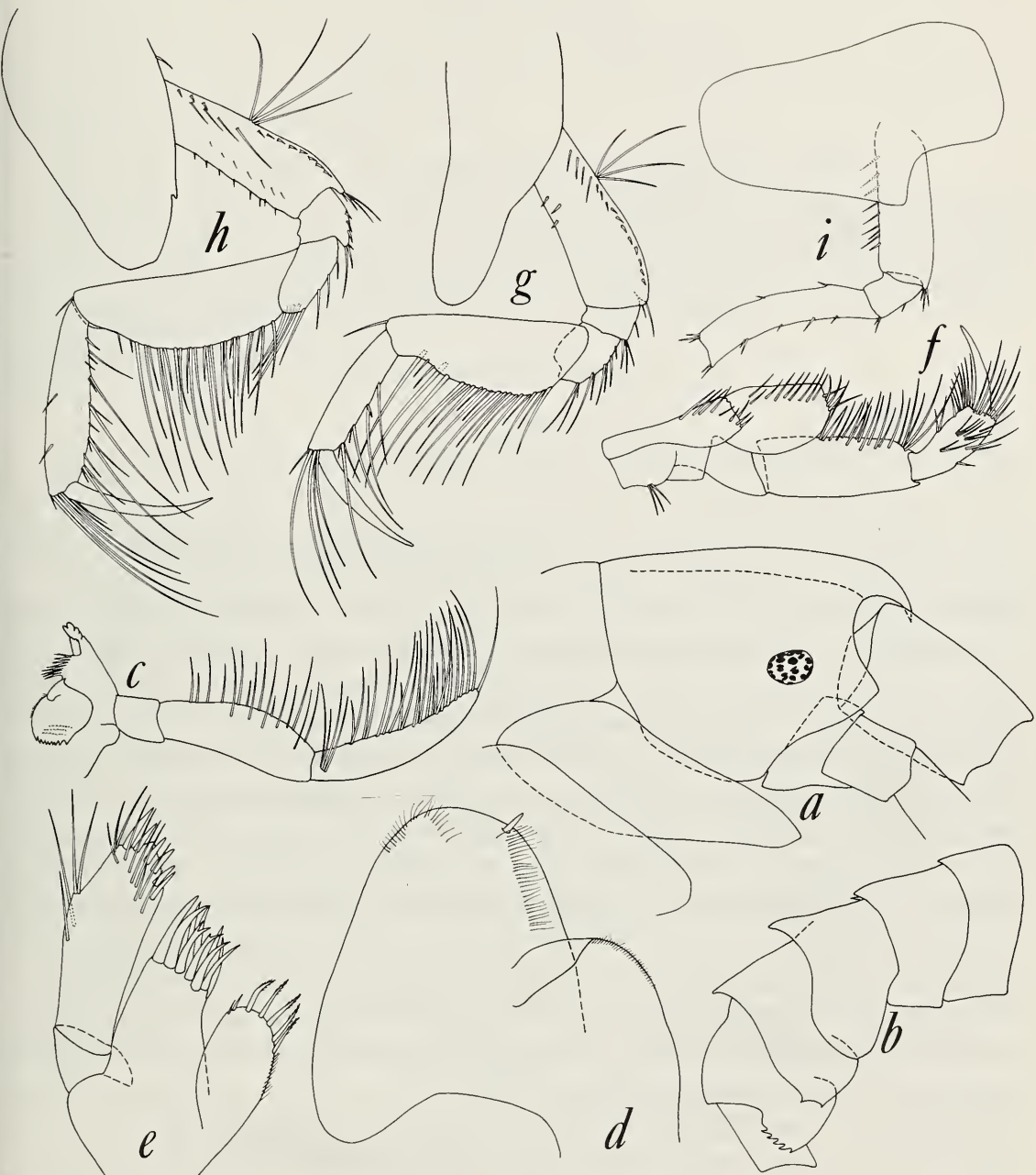


Fig. 25. *Parepimeria minor*, female: a, Head and pereonite 1; b, Pereonites 6 and 7 and pleonites 1-3; c, Mandible; d, Lower lip; e, Maxilla 1; f, Maxilliped; g, Gnathopod 1; h, Gnathopod 2; i, Pereopod 4.

Diagnosis.—Rostrum short, blunt; head with dorsal keel; body with paired dorsolateral processes of variable strength on pereonites 2-7; mid-dorsal carinae on pleonites 1 and 2, pleonite 3 dorsally keeled; epimeral plate 3 posterior margin serrate; maxilliped palp article 4 strong; gnathopod 1 articles 6 and 7 subequal in length.

Description.—Head, rostrum short, blunt; dorsal keel extends length of



Fig. 26. *Parandaniexis dewitti*, female: Body, side view.

head; antennal angle subacute; eye slightly protruding, ommatidia not contiguous. Body with paired, low, sub-dorsal processes on pereonites 2–7. Pleonites 1 and 2 with mid-dorsal carinae; pleonite 3 dorsally keeled; epimeral plate 3 posterior margin serrate. Mandible molar strong, tritulative; incisor multidentate; lacinia mobilis of right mandible with 3 teeth; palp articles 2 and 3 elongate, subequal, with dense rows of setae along ventral margin; palp article 3 with proximal group of setae dorso-medially. Lower lip with nearly coalesced inner lobes; outer lobes broadly rounded, 1–3 blunt setae medially near apex. Maxilla 1 palp apex with 6 stout setae; inner plate with 4 short plumose setae terminally. Maxilliped palp 4-articulate; article 4 strong, as long as article 3; outer plate extends halfway along palp article 2; inner plate reaches base of palp article 2. Gnathopod 1 simple; coxa subacutely produced anteriorly; article 7 as long as article 6; article 5 proximally expanded. Gnathopod 2 similar to gnathopod 1 but slightly larger; coxa narrowly rounded distally. Coxa 4 broadly rounded distally, posterior margin excavate proximally. Telson entire.

Etymology.—The name refers to the small size of the species.

Distribution.—Known only from the locality listed above.

Remarks.—This species differs from the other species which have a short rostrum by the serrate posterior margin of epimeral plate 3 (smooth in *P. major*) and the narrow distal margin of coxa 2 (broadly rounded in *P. irregularis*). K. H. Barnard (1932) described an aberrant form and a variety (*miothele*) of *P. crenulata* which seem to be very similar to *P. minor*. Barnard's var. *miothele* differs from *P. minor* in having no pleural tubercles on the pereonites and a short non-deflexed rostrum which extends halfway along antenna 1 peduncle article 1. The aberrant form is described as having a short rostrum and, on pleonite 3, only a mediodorsal keel. Barnard does not indicate whether or not the rostrum is deflexed so it is not possible to determine its affinities with *P. minor*.

Stegocephalidae

Parandaniexis Schellenberg*Parandaniexis* Schellenberg, 1929.*Type-species.*—*Parandaniexis mirabilis* Schellenberg, 1929.*Diagnosis* (from J. L. Barnard, 1969).—Mandible incisor smooth; maxilla 1 palp biarticulate; maxilla 2 outer plate not geniculate or gaping; maxilliped palp article 2 not produced; pereopods 5 and 6 article 2 slender; pereopod 7 article 2 broad; pereopod 4 subchelate; telson entire.*Parandaniexis dewitti* n. sp.

Figs. 26, 27

Material.—*Islas Orcadas* Cruise 575, Sta. 38, 22 May 1975, 57° 00.4'S, 26°10.1'W, 2,740–2,757 m, 2 ♀♀: holotype 42 mm, with eggs, USNM 173594; paratype 32 mm, USNM 173595.*Diagnosis.*—Body with strong mid-dorsal carinae on pleonites 1–3, elongate, thin, mid-dorsal tooth on urosomite 1; antenna 1 basal flagellar article only slightly longer than peduncle; pereopod 4 subchelate, propodus with slight proximal lobe on ventral margin.*Description.*—Ovigerous female. Head submerged in pereonite 1. Eye lacking. Body with strong mid-dorsal carinae on pleonites 1–3. Urosomite 1 with mid-dorsal elongate curved tooth. Epimeral plates 2 and 3 posterodistal corner acutely extended. Coxa 1 anteroventral corner subacute, posterior margin rounded. Coxa 2 subacute distally; coxae 3 and 4 anterodistal margins convex distally, posterodistal margins concave distally, both plates ventrally subacute.

Antenna 1 peduncle slightly shorter than basal flagellar article; uniaarticulate accessory flagellum extends more than halfway along basal flagellar article; main flagellum of 6 articles. Antenna 2 peduncle article 5 as long as flagellum; article 4 very short, as long as wide. Upper lip twice as wide as high, emarginate. Mandible incisor smooth, accessory tooth subtriangular, present in left mandible only. Lower lip lobes broadly rounded, with dense covering of fine setae. Maxilla 1 palp biarticulate, extending beyond outer plate; palp second article armed with short, stout setae along apex and distal half of medial margin; outer plate armed with elongate heavy spines; inner plate with 11 elongate, less robust setae. Maxilla 2 inner plate 3 times as wide as outer plate; outer plate distal setae non-plumose. Maxilliped palp 4-articulate, article 2 not produced, articles successively decreasing in length and width, outer plate broadly ovate, armed with short setae; inner plate short, reaching base of palp, medial margin armed with elongate setae. Gnathopods 1 and 2 simple; gnathopod 1 articles 5 and 6 subequal in length; gnathopod 2 article 6 longer than article 5. Pereopod 2 subchelate; propodus ventral margin excavate, bearing small proximal pro-

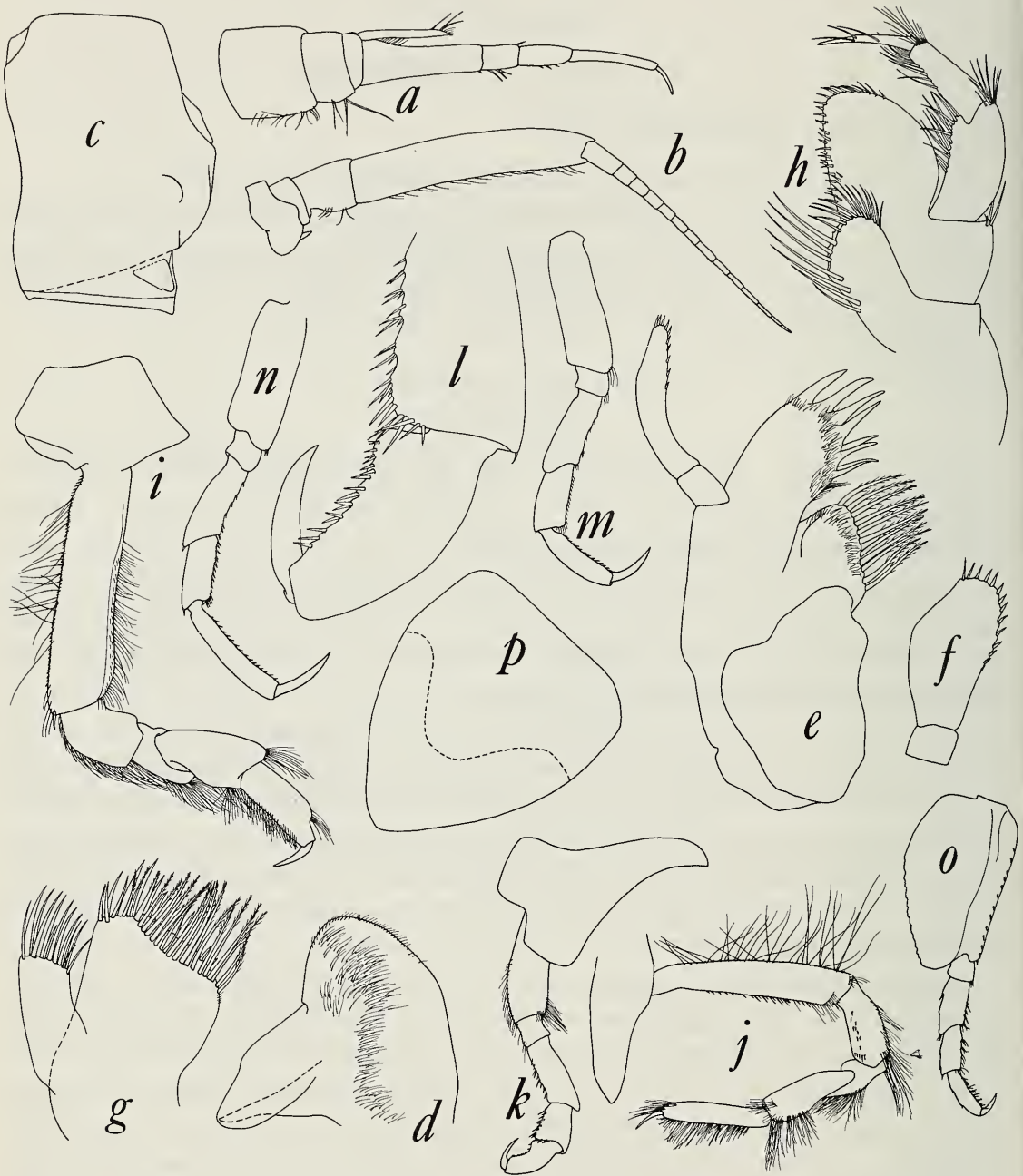


Fig. 27. *Parandaniexis dewitti*, female: a, Antenna 1; b, Antenna 2; c, Mandible; d, Lower lip; e, Maxilla 1; f, Maxilla 1 palp; g, Maxilla 2; h, Maxilliped; i, Gnathopod 1; j, Gnathopod 2; k, Pereopod 2; l, Pereopod 2 distal end; m, Pereopod 5; n, Pereopod 6; o, Pereopod 7; p, Telson.

tubercle with continuous row of short setae; articles 5 and 6 subequal. Pereopods 5 and 6, article 2 slender; pereopod 6 article 6 slightly longer than article 4. Pereopod 7 article 2 broad, tapering distally. Telson entire, apically subacute.

Etymology.—The species is named in honor of Dr. H. H. DeWitt, Chief Scientist for the cruise during which the specimen was collected.

Distribution.—South Sandwich Islands.

Remarks.—The subchelate pereopod 4 and the morphology of the mouthparts unquestionably places this species in the genus *Parandaniexis*. It differs from the only other known species, *P. mirabilis* Schellenberg by the shorter basal flagellar article of antenna 1, curved and acutely tapering coxae 3 and 4, large carinae on pleonites 1–3, and small ventral lobe on pereopod 4 propodus. The outline of the body is remarkably similar to that illustrated for *Andaniexis spinescens* (Alcock 1894). The latter species, originally placed in the genus *Andania* by Alcock, was moved to the genus *Andaniexis* by Stebbing (1906). It was so incompletely described, however, that its precise affinities are impossible to establish.

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